Heterogeneous effects of weather shocks on firm economic performance

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Introduction

- Carbon taxation in Integrated Assessment Models:

$$\tau_t = \underbrace{-\mathbb{E}_t \sum_{j=0}^{\infty} \beta^j \frac{u(c_{t+j})}{u(c_t)} \frac{\partial Y_{t+j}}{\partial A_{t+j}} \frac{\partial A_{t+j}}{\partial T_{t+j}} \frac{\partial T_{t+j}}{\partial E_t}}_{\equiv \text{SCC}}$$

- Carbon tax equals the Social Cost of Carbon (SCC)

Introduction

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- Why Romano's work is so important? Climate damages at the heart of carbon tax/SCC

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- Caggese *et al.* (2024) map firm-level damages into aggregate damage function

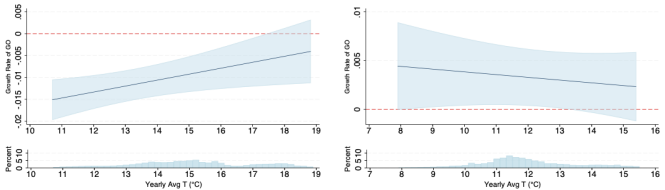
Comment 1: Empirical Specification

- Empirical specification:

$$\Delta y_{it} = f\left(\boldsymbol{T}_{g(i)t}, \boldsymbol{T}_{g(i)t-1}, ...; \boldsymbol{\beta}\right) + ... + \varepsilon_{it}$$

- Somehow different from recent papers on firm-level data ...
- Why Δy_{it}? Similar to Nath *et al.* (2024)
  - Time series identification: Cross-country reg. with persistent growth and climate shocks
  - But your identification is cross-sectional. Growth opportunities random and lumpy, concentrated in few firms ...
- Why quadratic avg. yearly temperature? What do you gain? What do you lose?

Comment 2: Country-Level Results



(a) Marginal Effect ES

(b) Marginal Effect FR

(c) Marginal Effect GB

(d) Marginal Effect IT

Figure 20: Marginal effect of an extra $1°C$ in yearly average temperature on the growth rate of gross output in Spain, France, Italy and Great Britain. Results from the quadratic model with firm and industry-year FE estimated excluding the bottom and top 1% of the temperature distribution.

Comment 3: Heterogeneity

- Empirical specification:

$$\Delta y_{it} = f\left(\boldsymbol{T}_{g(i)t}, \boldsymbol{T}_{g(i)t-1}, ...; \boldsymbol{\beta}\right) \times \boldsymbol{Q_{it}} + ... + \varepsilon_{it}$$

- Firms ranked by profitability, $p_{it}z_{it}$:
  - Ranking "based on the first two years the firm is available in the sample." Why not before "last" temp. shock?
  - What about dropping multi-plant firms?