The Green Lerner Index

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Motivation

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Question: how does this trade-off change the optimal design of antitrust policy?

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Results: the GLI ranking substantially changes enforcement priorities

- Low-emissions sectors become prime targets
- High-emissions sectors move down the priority list

Literature

Market power and environmental policy:

Buchanan (1969); Barnett (1980); Fowlie et al. (2016); Preonas (2024); O'Connell & Smith (2024)

$\Longrightarrow$ we show that climate externalities change antitrust targeting

Welfare effects of mergers and antitrust:

Williamson (1968); Farrell & Shapiro (1990); Ivaldi & Verboven (2005); Nocke & Whinston (2022); Berger et al. (2025); Kaplow (2023); Conlon & Rao (2025)

$\Longrightarrow$ a different trade-off from synergies or innovation: market power distortions vs. climate damages

Competition and the environment:

Aghion et al. (2023); Schinkel & Spiegel (2017); Schinkel et al. (2022)

$\Longrightarrow$ a general-equilibrium sufficient statistic for policy targeting, and its quantification

A model of antitrust with emissions

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Industries and firms: many industries, each with a few large firms; a firm's markup rises with its market share (Atkeson & Burstein, 2008; Burstein et al., 2025)

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Market power is summarized by concentration: the Herfindahl-Hirschman Index (HHI), already used by the US Merger Guidelines, pins down the industry markup

$$\mu_i = \frac{\sigma}{\sigma - 1}\left[1 - \left(\frac{\frac{\sigma}{\theta} - 1}{\sigma - 1}\right) HHI_i\right]^{-1} \qquad \text{increasing in } HHI_i \text{ when } \sigma > \theta$$

Cournot competition; σ and θ: elasticities of substitution within and across industries

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Emissions: each unit of output Y_i of industry i emits ϕ_i units of CO_2; total emissions E reduce aggregate productivity (Nordhaus, 2008), and firms ignore this because carbon is not priced

▸ Model equations ▸ Enforcement and markups

Welfare effect of stricter enforcement

Marginal welfare effect $\mathcal{W}_i$ of stricter enforcement in industry i (in units of the final good):

$$\mathcal{W}_i = \underbrace{v_i \frac{\partial Y_i}{\partial a_i} \left[\mathcal{L}_i - \sum_{j \neq i} \rho_{ji} \mathcal{L}_j \right]}_{\text{Competition effect}}$$

where

- $\mathcal{L}_j = 1 - 1/\mu_j$ is the **Lerner index**: the price–cost margin as a share of the price
- $v_i \, \partial Y_i / \partial a_i$ is the value of the extra output in industry i; ρ_{ji} measures how much of it is reallocated from industry j (Kaplow, 2023)
- $\Delta(E)$ is the climate damage per unit of emissions; ϕ_j the emissions per unit of output in industry j

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The Green Lerner Index

Proposition 3.1 (Green Lerner Index)

$$\widetilde{\mathcal{L}}_j \equiv \mathcal{L}_j - \frac{\Delta(E)\,\phi_j}{v_j}$$

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$$\widetilde{\mathcal{L}}_j \equiv \mathcal{L}_j - \frac{\Delta(E)\,\phi_j}{v_j} \qquad \mathcal{W}_i = v_i \frac{\partial Y_i}{\partial a_i}\left[\widetilde{\mathcal{L}}_i - \sum_{j \neq i} \rho_{ji}\,\widetilde{\mathcal{L}}_j\right]$$

- the sign of the welfare effect is the target's GLI **relative to** the GLI of the industries it draws demand from; its size scales with the output response $v_i\,\partial Y_i/\partial a_i$
- with an optimal carbon tax, the standard Lerner index is the right statistic; the GLI is the **second-best** statistic when carbon is not fully priced

▸ Derivation

Taking the index to US data

Measuring the Green Lerner Index

$$\widetilde{\mathcal{L}}_i = \mathcal{L}_i - SCC \times EI_i$$

Lerner index from concentration: Census HHI (market shares of the 50 largest firms in 2017 and 2022), mapped into markups with the model formula, $\sigma = 5$ and $\theta = 1.754$ (Burstein et al., 2025)

Emissions intensity EI_i: EPA Greenhouse Gas Reporting Program (2010–2023) direct facility emissions divided by BEA gross output, in tons of CO_2e per dollar of output

Social cost of carbon (SCC): \$252 per ton (Moore et al., 2024); high scenario \$928 per ton (Bilal & Känzig, 2024) (2017 dollars)

Sample: 39 industries (NAICS 3-digit, the US industry classification; 81 at 4 digits as a robustness check)

▸ Calibration and summary statistics