The Macroeconomic Impacts of Climate Policies

IIES/SNS International Policy Talk

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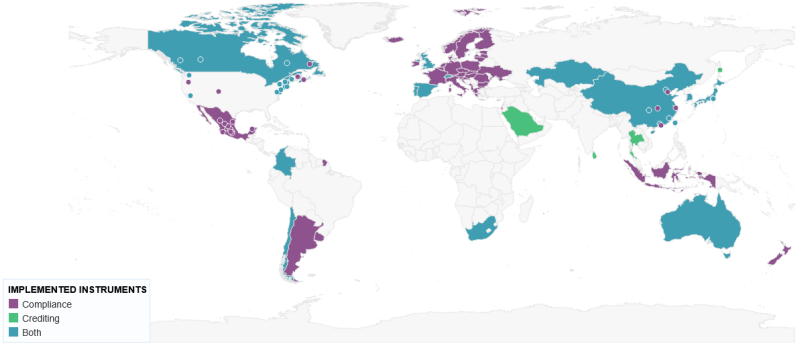
The climate challenge

- **Climate change** is the defining problem of our time
- We know the textbook fix: put a **price on carbon**
- Very hard at the global level because of **coordination problems**
- More progress at the **national level**

Carbon pricing around the world

Carbon pricing instruments around the world, 2025

Map shows jurisdictions that have implemented Direct Carbon Pricing Instruments - Compliance instruments (Emissions Trading Systems (ETS) and Carbon taxes) and/or domestic carbon crediting mechanisms, subject to any filters applied. The year can be adjusted using the slider below the map.



Source: World Bank Carbon Pricing Dashboard

Research questions

1. Are national carbon pricing policies effective at reducing emissions?

2. What are the macroeconomic effects?

3. And the distributional impacts?

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   Negligible

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- Focus on EU ETS – the largest carbon market in the world (Känzig, 2025)

Identification challenge

- Policymakers **respond** to economic developments when deciding on climate policy
- Cap-and-trade prices are **market prices** driven by demand & supply

EU ETS price. Source: Känzig (2025)

Identification challenge

- **Institutional** features allow for credible identification of carbon price impacts
- Cap-and-trade regulates quantity, establishes **market price** for carbon
- Liquid **futures markets** on allowances
- Regulations in the market **changed** considerably over time
- Isolate carbon policy news by price change in **tight window** around **policy events**

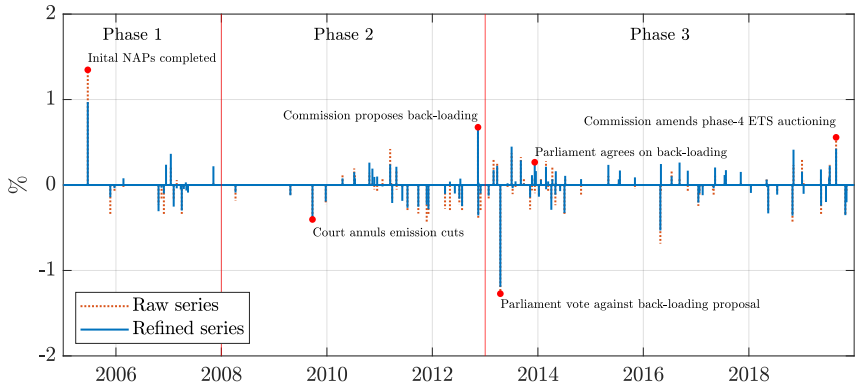
European carbon market

- Established in 2005, covers around **40%** of EU GHG emissions
- **Cap** on total emissions covered by the system, reduced each year
- **Emission allowances** (**EUA**) allocated within the cap
  - free allocation
  - auctions
  - international credits
- Companies must surrender **sufficient** EUAs to cover their yearly emissions
  - enforced with heavy fines
- Allowances are **traded** on secondary markets (spot and **futures** markets)

Regulatory events

- Collected **comprehensive list** of **regulatory update** events
  - Decisions of European Commission
  - Votes of European Parliament
  - Judgments of European courts
- Of key interest: regulatory news on the **supply of allowances**
  - National **allocation plans**
  - **Auctions**: timing and quantities
  - Use of international credits
- **Identified 114** relevant **events** from 2005-2019

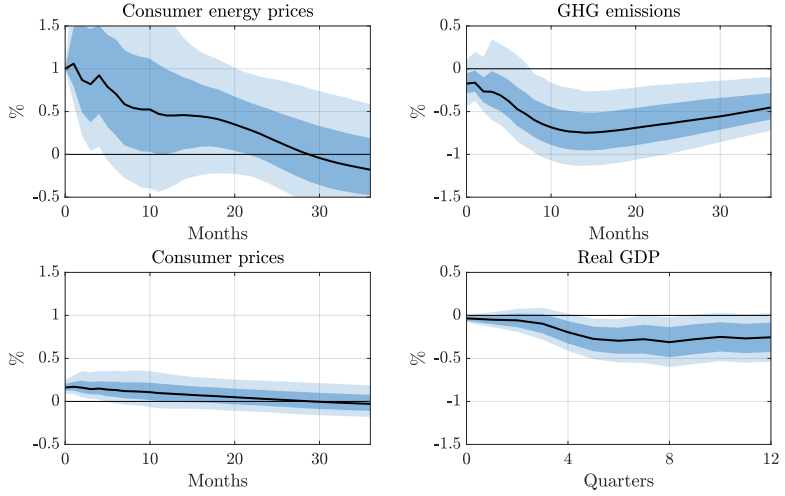
Carbon policy surprises



Source: Känzig (2025)

- Use as instrument to estimate effects of **carbon-policy** induced energy price **shock**

The aggregate effects of carbon pricing



Notes: The solid line is the point estimate and the dark and light shaded areas are 68 and 90% confidence bands.
Source: Känzig (2025)

Revisiting marginal abatement cost

- Back-of-the-envelope estimate based on responses gives **MAC** of $\approx$ €107/tCO_2
- Higher than engineering estimates & avg. ETS price over the sample $\approx$ €12/tCO_2
  - Market prices do **not internalize** indirect effects via prices, consumption, employment
  - Higher economy-wide costs of decarbonization
- Important implications for **cost-benefit analyses**

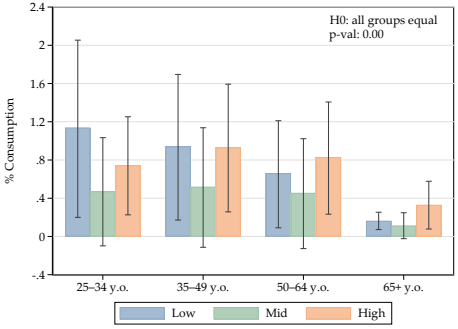
Distributional effects

- Study how carbon price shocks affect different households
- Measure changes in **living standards** by tracking how shocks move key parts of household budgets:
  - prices people pay
  - income they earn
  - value of their savings and transfers they receive
- Combine these channels to get a simple **money-metric measure of welfare loss**

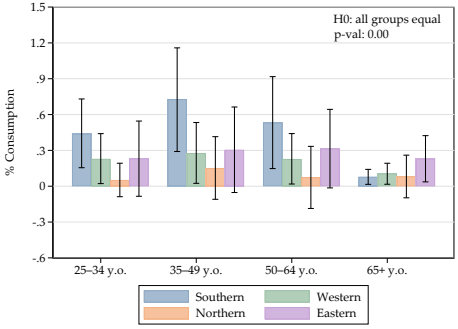
Heterogeneity by income and region

- Low-income households are most affected
  - They have higher energy shares in budgets, but also experience larger income losses
- Southern & Eastern Europe hardest hit due to rigid labor markets

(a) Welfare by income groups



(b) Welfare by regions

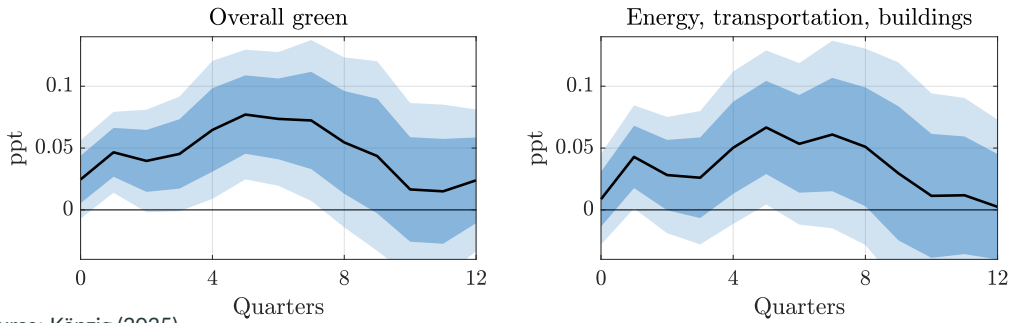


Source: Bigio et al. (2025)

Long-run perspective

- Transition policies may have short-run costs but **long-run gains**
  - Innovation, cleaner growth, resilience

Patenting responses

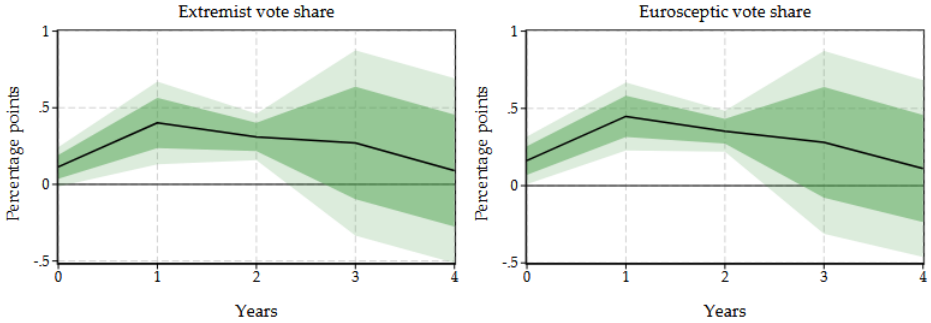


Source: Känzig (2025)

Long-run perspective

- The challenge: managing the transition **without losing public support**
  - Yellow vest movement, Canadian carbon tax, …

Effect on polarization



Source: Konradt & Mangiante (2025)

Revisiting research questions

Based on experience with **EU ETS**:

1. Are national carbon pricing policies effective at reducing emissions?
   Yes, EU ETS led to substantial reduction in emissions

2. What are the macroeconomic effects?
   But this comes at a considerable economic cost

3. And the distributional impacts?
   Costs are unequally distributed, with poorer households suffering the most

Policy implications

- Important to **address** economic and distributional effects
  - **Targeted transfers** or recycling revenues can offset regressivity
  - Since energy demand is inelastic, redistribution need **not** reduce abatement
- Even without offsetting measures, still **optimal to decarbonize**
  - Recent estimates of Domestic Cost of Carbon $\approx$ €200/tCO_2 $>$ MAC (Bilal and Känzig, 2025)
- **Communicate benefits** of the policy well!
  - For instance as in Switzerland as rebates to health insurance premiums

Thank you!