EUROPEAN CENTRAL BANK

EUROSYSTEM

Discussion: "On the Geographic Implications of Carbon taxes"

By Bruno Conte,

Klaus Desmet and

Esteban Rossi-Hansberg

20/09/2022

Mar Delgado

ECB workshop on "Fiscal policy and climate change"

The paper in a nutshell

- Multi-sector dynamic spatial integrated assessment model (S-IAM)

- Model:
  - Workers: utility: consumption & local amenities, cost of moving.
    Two dispersion forces: Heterogeneity in preferences + Local amenities congestion
  - Firms: produce a variety in a jurisdiction, using labour, labour innovation, energy and land. Pay an ad-valorem tax on energy expenditure.
    Affected by: sectoral agglomeration economies and temperature.
  - Global energy supply and Carbon cycle.
  - Government: tax revenue: lost, rebated in location who paid them, on all EU, or to the developing countries.
  - Market clearance of labour, land, goods and energy

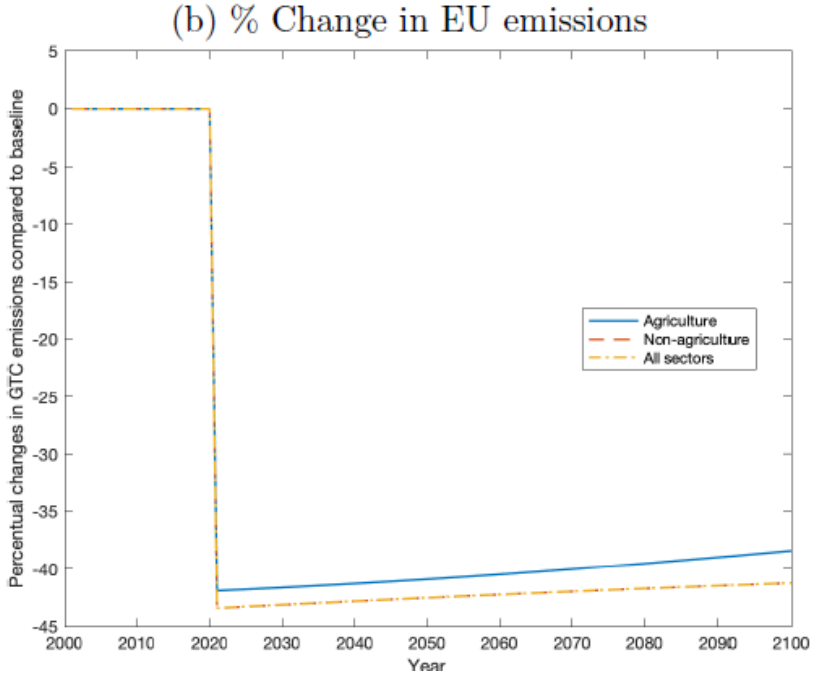
The paper in a nutshell

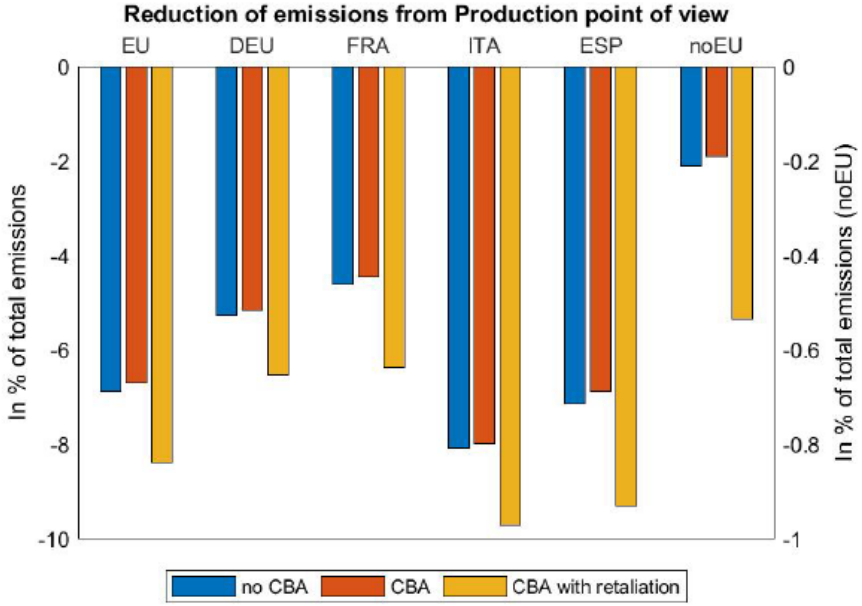
- Assumptions on tax rebate:

  - loss of taxes→ less growth, increase of weight in agriculture in the center of the EU, less population.
  - local rebate→ Increase in welfare with increase in industry and population if
    - tax not bigger than €55 per CO_2 ton,
    - trade elasticity low
    - heterogeneity of localization low
  - EU per capita rebate→ higher tax rebate in low income areas, less agglomeration economies and less real income
  - Developing countries rebate→
    - for EU: loss of tax revenue, less population than first scenario
    - reduction of spatial inequalities.

Comments: reduction of emissions

- Short term abrupt correction and reduction of GHG (Figure 6).
- Delgado and Santabarbara (2022), much smaller short-term reduction from a 50€ tax

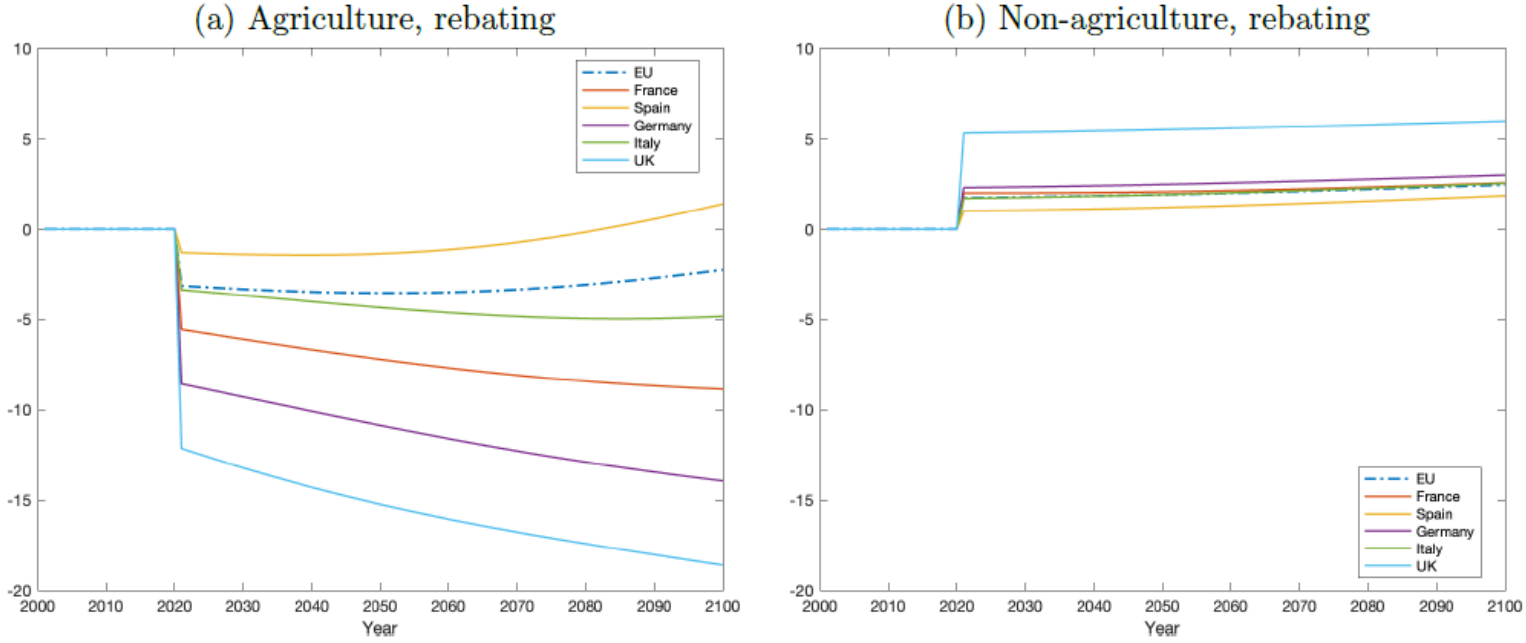




Comments: emissions in local rebate scenario

- Are the aggregate emissions increasing with the carbon tax?

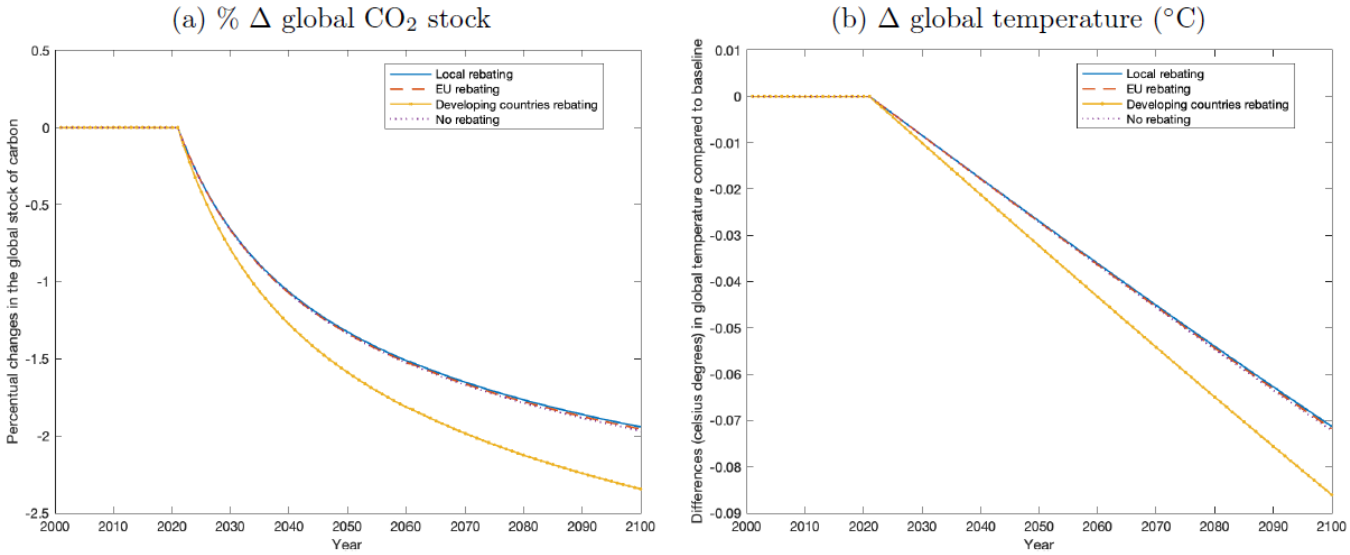
Figure 8: Change in Sectoral Output Due to Carbon Taxes (Local Rebating), Select Countries



Comments: reduction of CO_2

- How is CO_2 decreasing so fast: if NASA estimate a rate of 300-1000 years to decay.

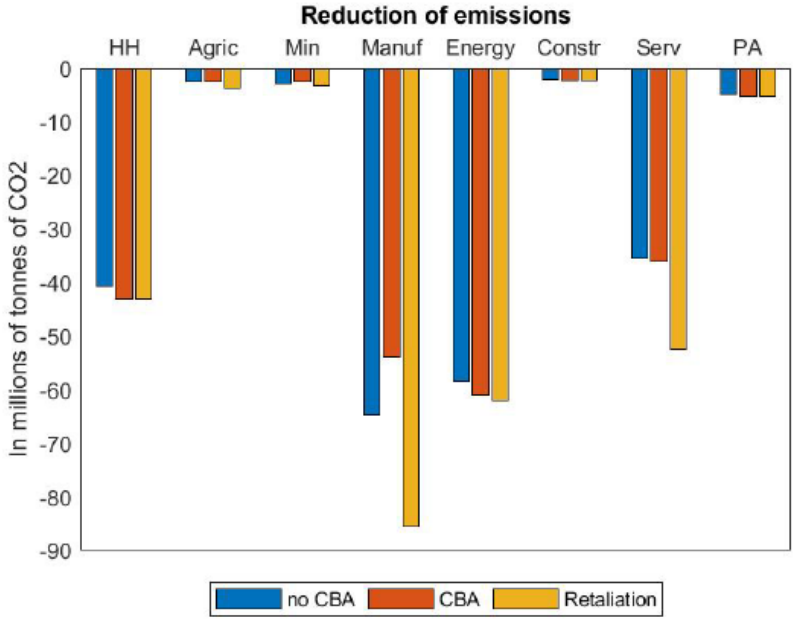
Figure 18: Effect of Different Rebating Schemes on Global CO_2 Stock and Temperature



Panel (a) displays change in global CO_2 stock under different rebating schemes, and Panel (b) displays change in global temperature (°C) under different rebating schemes.

Comments: Sectoral decisions

- Only two sectors: Agriculture and non-agriculture. Could you include industrial and non-industrial instead? Or intensive and non-intensive in energy. Do households also pay the tax?



Comments: Energy sector

- Energy supply homogeneous among countries? Is there no alternative source of energy?
- Is there no technological change in energy sector? The tax is not helping clean energy transition?
- With some substitution→ smaller impact on the activity in the long run & smaller tax revenue.

Papageorgiouy, C., M. Saam and P. Schulte (2017). “Substitution between Clean and Dirty Energy Inputs: A Macroeconomic Perspective”, The Review of Economics and Statistics, MIT Press, vol. 99(2), pages 281-290, May.
They estimate an elasticity of substitution between clean and dirty generation capacity of about 1.8.

Additional Comments

- Alternative uses of taxes: public investment of subsidies for green transition.
- Change in productivity in agriculture? Southern Europe less productive because of Climate Change.
- Have you used this model for CC impact estimation → reduction of agriculture productivity & migration?
- Could the tax be implemented gradually? The impact on activity and inflation may be lower in case of a more gradual approach.

Congratulations for a very nice paper with lot of potential and several possible alternatives exercises!

Thank you for your attention!