Carbon Tax and Equity

The Importance of Policy Design

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Problematic: Equity at the heart of acceptability

- Large theoretical consensus among economists
  carbon tax = the most efficient instrument in the policymaker’s “tool box”

- Why so many attempts have failed?
  - A similar “refusal front” based on 2 major arguments
    - Competitiveness distortion
    - Negative impact on income distribution

- *Is a carbon tax reform mechanically regressive? To what extent does policy design matter?*
  - Empirical *ex ante* evaluation of the French carbon tax reform
Outline

1. Perceived impact: evidence for “ regressivity”
2. Perceived vs. real impact: reasons for the gap
3. Comparison of two revenue-recycling schemes
4. Decomposition of the ultimate distributive impact
5. Summing up the main results
Perceived impact: evidence for “regressivity”

Households ranked by level of standard of living (Current annual income / consumption unit - OECD)

Data: *Budget des familles*, INSEE, Income and expenditure survey

The “rich” will pay more…
… But the budget of the “poor” will be more affected

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Perceived vs. real impacts: reasons for the gap

- A very short-sighted, incomplete and over-simplified picture
  - no behavioural adaptation response (energy mix and quantities consumed)
  - no effects on and feedbacks with the rest of the economy
  - no recycling scheme of the tax proceeds (implicitly reduce public dept)
  - no other important dimensions of vulnerability:

![Budget share of energy for 10 305 French households](chart.png)

Annual household standard of living (euros)
What is needed to fill the gap?

- A behavioural model to represent
  - substitution possibilities (non-constrained energy consumption)
  - price-elasticities (sensitivity of consumption to price)

- A general equilibrium model to trace out
  - the macroeconomic impacts on the whole economy
    - production side, cost-propagation effect, competitiveness, …
  - the distributional effects among households’ classes
    - disposable income, employment, …
  - the consequences of alternative use of the tax proceeds
    - direct compensations to household
    - reducing pre-existing distortive tax
    - cutting public deficit

No separability between equity and efficiency in the real world

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Key features of the model

- CIRED’s computable general equilibrium model IMACLIM-S
  - France 2004, open economy
  - Circulation of consistent monetary and physical flows
  - 4 categories of economic agents
    - Corporate firms, public administrations, 20 income classes, and the rest of the world
  - 3 energy sectors (1 primary, 2 transformed energies) + composite good
    - Factor substitution possibilities and price formation in production sectors
  - A second-best world
    - Pre-existing distortions of the French tax system
    - Constraint levels on production factors and final goods consumptions
    - Structural situation of unemployment and limited wage flexibility

- Simulation of counterfactual 2004 France (20 years after implementation)
Comparison of two revenue-recycling schemes

1) Direct Compensation
   (Identical lump sum transfert per CU)

   - Total CO₂ Emissions: -28.5%
   - Real GDP: -0.9%
   - Employment: -0.2%

2) Payroll Tax Cut
   (Distortive tax on labour market)

   - Total CO₂ Emissions: -27.1%
   - Real GDP: +1.5%
   - Employment: +2.8%

Towards on efficiency-equity dilemma?

- Real Consumption (class total)
  - 5% poorest: +9%
  - 30% modest: +6%
  - 30% median: +3%
  - 30% rich: -3%
  - 5% richest: -6%

200 € per tCO2 (€2004) – households and firms

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A decomposition of the ultimate distributive effect

\[ \Delta C = TC + D + M \]

Ultimate impact on real consumption

- Carbon tax payments
- Direct compensation
- Macroeconomic adjustments on disposable income

Policy design matters!

<table>
<thead>
<tr>
<th>Revenue-recycling mode</th>
<th>Poorest households’ consumption</th>
<th>Richest households’ consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Direct Compensation</td>
<td>+ 6.7% = - 2.7% + 11.5% - 2.1%</td>
<td>- 1.9% = - 1.7% + 3.0% - 3.2%</td>
</tr>
<tr>
<td>2) Payroll Tax Cut</td>
<td>+ 0.7% = - 2.7% + 0.0% + 3.4%</td>
<td>+ 4.7% = - 1.7% + 0.0% + 6.4%</td>
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Conclusion

- A decomposition of the ultimate distribution impact
- A carbon tax reform is not mechanically regressive
- The recycling of the tax proceeds is crucial
  - Macroeconomic effects studied with a general equilibrium framework
  - Policymakers face a equity-efficiency dilemma
  - BUT … room for a compromise in the case of France
- Towards a dynamic and long term perspective to investigate the best “sustainable use” of the carbon tax proceeds

>Can climate change policies be the solution to finance our pensions?

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Questions or Comments?

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