Carbon Taxation and Social Progress

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CIRED
A gap between theory and practice

Large theoretical consensus among economists

Carbon tax = the most efficient instrument for reducing CO₂ emissions

VS

A frequent blocking of the implementation

- Higher energy prices will harm activity, competitiveness and employment
- It will affect the most vulnerable (households and industries)
- And it will risk to jeopardize other objectives (debt reduction...)

Key lessons from economic literature

- No exemption for environmental efficiency
- A key question: how to use the carbon tax revenue?
- The most efficient recycling option: lower social contributions
- The net impacts on activity and employment are uncertain
- The equity objective may justify other recycling options
- Very few links with other long term policies (pensions, debt)
1. Net macroeconomic impact. Lessons from a stylized model


A simplified model of second best economy

• All the energy consumed is imported
• One domestic product, in competition with foreign products
• Two factors of production: energy and labour
• Fix technical coefficients + households’ energy consumption
• Existing tax on energy (quantity) and on labour (ad valorem)
• Nominal net wage adjusts to unemployment
• Net exports adjust to domestic production cost/price
The net impact depends on 2 controversial parameters

Sensitivity of net exports to domestic price

\[ \text{Sensitivity of net wage to unemployment} \]

\[ I \text{ et } II : \text{Gains} \]

\[ III : \text{Losses} \]
### Conditions for a net employment gain

<table>
<thead>
<tr>
<th>Domaines</th>
<th>Unemployment</th>
<th>Production</th>
<th>Wages</th>
<th>Price</th>
<th>Consumption</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>-</td>
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<td>III</td>
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</table>

**I**: The positive impact on real trade dominates

**II**: The positive impact on wage growth dominates

**III**: The negative impact on energy bills dominates
Domain III (activity and employment losses) is narrow when:

1. Unemployment is initially high

2. Net nominal wage is initially low

3. Energy consumption by households is initially high and higher than the energy consumption by productive systems
To deepen the analysis

1. Empirical information on the initial state

2. Empirical information on the future context

3. Energy-saving potentials & structural change possibilities

4. Behaviour of public administrations (other reforms, targets)

5. Heterogeneity of agents & redistribution
The hybridization of economic and energy data

Available energy statistics

Step 1

Matrix of quantities (energy unit)

Matrix of prices (currency/energy unit)

Step 2

Energy bills (currency)

\[ V_{ij} = P_{ij} \cdot Q_{ij} \]

Step 3

‘Hybrid matrix’

Statistical gaps allocated to non-energy goods

The hybridization of economic and energy data
1. Higher competition on resources and markets
   - IMACLIM-R: a barrel of oil at 60€ (optimist, 77€ in 2011)
   - IMACLIM-R: lower wages /production costs in emerging economies

2. Consequences of the demographic transition
   - COR: funding needs for pensions 41-48 billions (11 en 2008)
   - CEPII: important decrease in the households’ saving rate

3. Growth and employment potentials after the crisis
   - COR: productivity and unemployment from the DGT
The simulation platform IMACLIM-S.2.4

Simultaneous equilibria in monetary and physical units (MTOE)

20 income classes

4 productions (3E + 1 ‘Composite’)

Public administrations

Limited adaptation capacity (technical constraints)

Equilibrium unemployment (constraint on the adjustment of wage)

Limited adaptation capacity (technical constraints & basic needs for energy)

Rest of the world
Flows of products & funds

International trade competitiveness function of the production costs

Public finance modalities (other reforms and multiplicity of objectives)

France in open-economy
Interaction of three mechanisms

- **Reform scheme**
  - **Oil bill**: Change in the levies on national incomes
  - **Tax burden transfer**: Change in production price

- **Structural change**: Change in employment intensity

- **Domestic consumption**
- **Employment**
- **Production**
- **Competitiveness**

**Interaction of three mechanisms**

- **Oil bill**
- **Tax burden transfer**
- **Structural change**
Reconnecting climate, pensions and deficits issues

Consider: 1) A 2020 France ‘COR compatible’
2) an objective: funding pensions over 2004-2020

Three structural reforms
- Higher legal retirement age (>3 yrs)
- Higher social contributions (+7 pts)
- €200/tCO₂ - Lower SSC & Higher Income Tax (+2 pts)
The 2 reform schemes are compared to a higher legal retirement age (> 3 yrs.)

<table>
<thead>
<tr>
<th>Reform schemes</th>
<th>Higher social contributions (CS)</th>
<th>200€/tC02 - Lower CS + Higher Income Tax (2pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil bill to GDP ratio</td>
<td>-1,1%</td>
<td>-17,5%</td>
</tr>
<tr>
<td>Labour intensity</td>
<td>-0,3%</td>
<td>+0,9%</td>
</tr>
<tr>
<td>Production price</td>
<td>+2,3%</td>
<td>+0,5%</td>
</tr>
<tr>
<td>Net nominal wage</td>
<td>-4,7%</td>
<td>+5,6%</td>
</tr>
<tr>
<td>Households’ consumption</td>
<td>-1,7%</td>
<td>+1,9%</td>
</tr>
<tr>
<td>Exports (volume )</td>
<td>-1,2%</td>
<td>-0,3%</td>
</tr>
</tbody>
</table>
And the argument of fairness?
The 2 schemes reduce CO$_2$ emissions by 34% over the period 1985-2004.
But there is room for compromises

This compromise scheme also reduces CO₂ emissions by 34% over the period 1985-2004
But energy vulnerability is ill-explained by ‘income’

A variety of technical, geographic and socioeconomic factors
Conclusion

Three crucial ‘parameters’ to find the best compromises

1. Balance between wage progression and control of costs

2. Coherence between policies (general reform of public finance)

3. Targeted support towards the most vulnerable to energy prices
Environmental Economics Lunch Seminar
September 26, 2013

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