Will European Industry Escape the Kyoto Protocol?

Ton Manders
CPB Netherlands Bureau for Economic Policy Analysis

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Climate policy = energy policy

‘Dirty’ energy is taxed  ↓ rising cost of energy

- Substitution away to other inputs
- Loss of competitiveness  ↓ relocation
- Carbon leakage
From the literature

- Environmental policy is just one of the factors
- How bad is relocation?
- Do not overestimate effects of environmental policies
Model analysis - WorldScan

- 16 regions, 16 sectors
- Applied general equilibrium model
- Welfare analysis
- No adjustment costs
- CO₂ only
Variants

Benchmark case
- Emission trading
- Without USA
- Banking hot air

Sensitivity analysis
- Baseline
- Model parameters

Policy variants
- Restrictions on emissions trade
- Participation USA
- Exemptions
- Tax reform
Effects differ by region

- Income (%)

-1.5
-1
-0.5
0
0.5

- WEU
- NLD
- BEL
- GER
- FRA
- GBR
- ITA
- ESP
Sectoral impacts are larger

-1,5
-1
-0,5
0
0,5

employment energy-intense (%)
Restrictions on trade and participation USA
<table>
<thead>
<tr>
<th></th>
<th>Benchmark</th>
<th>No trade</th>
<th>With USA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emission price (US$/tC)</strong></td>
<td>27</td>
<td>variable</td>
<td>75</td>
</tr>
<tr>
<td><strong>Leakage rate (%)</strong></td>
<td>22</td>
<td>27</td>
<td>14</td>
</tr>
<tr>
<td><strong>Welfare (%)</strong></td>
<td>–0.15</td>
<td>–0.35</td>
<td>–0.30</td>
</tr>
<tr>
<td><strong>Employment energy-intense (%)</strong></td>
<td>–0.23</td>
<td>–0.71</td>
<td>–0.21</td>
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</tbody>
</table>
Energy tax ≠ Carbon tax

![Bar chart showing tax rates for NLD, GER, and USA for coal, oil, and gas.](chart.jpg)
### Exemptions and tax reform

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<th>Tax reform</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emission price (US$/tC)</strong></td>
<td>27</td>
<td>32</td>
<td>351</td>
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<tr>
<td><strong>Leakage rate (%)</strong></td>
<td>22</td>
<td>18</td>
<td>56</td>
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<tr>
<td><strong>Welfare (%)</strong></td>
<td>-0.15</td>
<td>-0.17</td>
<td>0.70</td>
</tr>
<tr>
<td><strong>Employment energy-intensive (%)</strong></td>
<td>-0.23</td>
<td>-0.00</td>
<td>-0.23</td>
</tr>
</tbody>
</table>
Trade-off between costs and dislocation

- Exemption energy-intensive industries
- Participation USA
- No emissions trade

Macroeconomic costs vs. Dislocation

- Benchmark case
- Tax reform
Conclusions

- Impacts ‘Kyoto’ are moderate
  - Welfare loss
  - Dislocation
  - Carbon leakage

- Impacts differ by region and sector

- Policy design is important
  - Emission trading, participation USA
  - Exemptions, taxes
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No fear of flying

ajgm@cpb.nl