Environmental taxation as a policy instrument for decarbonization in Europe - Italy and Scandinavia considered

Mikael Skou Andersen, professor of policy analysis

Energy that transforms. Opportunities and social challenges of the de-carbonization process

Workshop at Fondazione Giangiacomo Feltrinelli, Milan (IT)
Countries in Europe with Carbon Tax

- Portugal (2014)
- France (2014)
- Ireland (2010)
- Iceland (2010)
- Switzerland (2008)
- Croatia (2007)
- Estonia (2000)
- UK (1998)
- Slovenia (1997)
- Latvia (1995)
- Denmark (1992)
- Norway (1991)
- Sweden (1991)
- Finland (1990)
Tax experts: Intelligent design can mitigate competitiveness impacts

- Full revenue-recycling can make the tail of the dog (of climate policy) wag (Nordhaus, 1993)

- Double dividend can arise when environmental tax replaces other distortionary tax (Goulder, 1995)

- Inflationary effects on labour salaries can be neutralised when environmental tax replaces social security contributions or other employer cost (Parry, 1995)
Experience shows carbon taxes cut emissions

% change in CO2
A carbon tax does not destroy the economy

% change in GDP due to revenue-neutral carbon tax (E3ME model)
Key political problem for low-carbon tax shift

- 20% of companies consume 60% of energy

- Energy-intensive industries are usually not very labour-intensive

- At company-level revenue-recycling will not be neutral; tax shift creates winners and losers

- Competitiveness effects are negative and positive
Denmark

-4,00
-3,00
-2,00
-1,00
0,00
1,00
2,00
3,00
4,00
5,00
6,00

meat paper chem. pharm. glass cement steel non-
ferrous

Savings of gross improved energy efficiency
Porter effect

ETR-burden upon revenue recycling

per cent of GVA

meat paper chem. pharm. glass cement steel non-
ferrous

-4,00
-3,00
-2,00
-1,00
0,00
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4,00
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6,00

AARHUS UNIVERSITY
Unit energy costs
(€ per 100 € value added)
Why energy taxes differ from energy prices

- via prices on imported intermediate goods a stronger impact on unit costs from energy prices
- from an increased energy price no revenue can be recycled to lower distortionary taxes
- psychologically the signalling effect of tax is probably stronger than of price
- accompanying policy measures differ
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The politics of carbon taxation: how varieties of policy style matter

Mikael Skou Andersen

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ABSTRACT

The momentum achieved for unilateral carbon taxes in seven European countries is examined. Why is it that small countries, despite being vulnerable to forces of international competition, have been able to implement carbon taxes? A review of national experiences does not suggest that the share of fossil fuels in the energy mix defines the room for such taxes, or point to a strong role for traditional left-right ideology. Rather, it is deep-seated patterns of national policy styles with neo-corporatist traits, providing a protective device for the open economies of small countries, which condition the introduction of carbon taxes. The associated routines of decision-making offer coordination mechanisms for proactive macro-economic policies in which carbon taxation can find a place. Parliamentary democracies with proportional representation, as is common in the smaller countries, provide access to government for political parties that pursue carbon taxation. These in turn sensitise larger political parties to climate concerns, as they benefit from institutionalised practices and routines for problem-solving and consensus-seeking.
Italy’s potential for environmental tax reform

› High share of labour and payroll taxes: #6 in Europe
› Env. taxes 8.2% of total

› Opportunities > 12.8%
  – Align diesel to petrol
  – Air pollution & CO2
  – Heavy goods vehicles
  – Water abstraction
  – Packaging tax and more
Total 34 billion euro
IMPLICIT TAXATION OF HEATING FUELS (Non-business)
Distributional issues

- Transport taxes
  - Shown in several studies to be progressive – high-income groups drive longer distances in bigger vehicles

- Pollution taxes
  - Correlate with consumption; no clear distributional profile

- Energy taxes
  - Electricity and heating tend to be regressive taxes, especially when levied as end-user taxes
  - Emission based taxes will penalise carbon, air pollution
  - Targeted compensation to low-income groups; 'green cheaque'
Swedish CO2-tax

This is a big FAT Carbon TAX

- Nordhaus: 17 $/tonne
- Stern speaks of 20-50 $/tonne
- 2008: RGGI 3.80 Chicago 4.50 MDP 17-25
- EU ETS: ~ 5 - 20$
- French Tax: 32 -- 17 €/tonne
- US 10 or 20

- Swedish Tax 165 $/ton + energy tax, fuel tax VAT etc. Gasoline costs about 9$/gal
The Nordic model of carbon-energy taxation

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Main principles

› Tax base
  1) Energy tax component – calorific
  2) CO2 tax component – implicit emissions
  3) Air pollution taxes - emissions

› Tax rate differentiation
  1) Energy tax: Motor fuels/Households/Business/Industry
  2) CO2 tax: Domestic vs. Manufacturing
  3) Air pollution taxes: Stationary sources

› Power and heat sector
  1) Electricity: end-user tax
  2) Heat: fuel-specific tax (good split required!)
  3) CHP & power: no CO2-tax (but ETS)

› All: Indexation
How to calculate calorific value and CO2

1. Net calorific value (NCV) in GJ per 1000 l of petrol

\[ \text{NCV (GJ/l)} \times \text{Density (kg/m}^3\text{)} / 1000 \]

44,0 (GJ/l) \times 745 (kg/m^3) / 1000 = 32,8 (GJ/1000 l)

2. CO₂ emissions in tonnes per 1000 l of petrol

\[ \text{Emissions} \times \text{NCV (GJ/1000 l)} / 1000 \]

factor (tCO₂/TJ)

69,2 (tCO₂/TJ) \times 32,8 (GJ/1000 l) / 1000 = 2,27 (tCO₂/1000 l)
Diesel: sum of energy and CO2 taxes € per GJ

Denmark

Sweden
Air pollution taxes: SO2 and NOx

Sweden’s SO2-tax (2014)

### Nominal rate

<table>
<thead>
<tr>
<th>Nominal tax rate SO2 (SE) €/kg sulphur</th>
<th>Motor fuels</th>
<th>ETS-industry</th>
<th>Manufact. indust\textsubscript{non-ETS}</th>
<th>Other business</th>
<th>Business heating</th>
<th>Non-business</th>
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<tr>
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</tbody>
</table>

1) Legal requirement below 0.05% sulphur threshold for tax. Excluding railways, shipping and aviation. *) råtalloil exempt

### Implicit rate

<table>
<thead>
<tr>
<th>Implicit tax rate SO2 (SE) €/GJ</th>
<th>Motor fuels</th>
<th>ETS-industry</th>
<th>Manufact. indust\textsubscript{non-ETS}</th>
<th>Other business</th>
<th>Business heating</th>
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<td>Kerosine\textsubscript{0.2%}</td>
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</tbody>
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1) Excluding railways, shipping and aviation. *) råtalloil exempt *免除<0.05% of weight
SO2-tax in Sweden € per GJ

- Heavy fuel oil 0,5%
- Coal and coke 0,5%

SO2 tax a strong signal to ETS-installations
Main observations

› CO2 taxes are high in Sweden and low in Denmark, but when considering sum of carbon-energy taxes per GJ, more similarities than differences

› Lower fuel tax rates for industry and business in Denmark offset by higher taxes for business heating

› CO2 taxes introduced against a lowering of energy taxation; then increased gradually (both countries)

› Air pollution taxes are a good complement to ETS; few exemptions - and relief to feed-in-tariffs

› Need to ramp up electricity taxes to be consistent
Could we do better?

“The art of taxation consists in so plucking the goose as to obtain the largest possible amount of feathers with the smallest possible amount of hissing”

Jean Baptiste Colbert (Minister of Finance under King Louis XIV of France. 1619-1683)
Thank you for your attention