Environmentally Harmful Subsidies in the Transport Sector

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Background

Michael Donohue, currently with Health Canada, prepared a paper [OECD, 2008] while he worked in the OECD Environment Directorate in 2006-2007, with the aim to help policy makers *better understand* the broad literature available on environmentally harmful subsidies in the transport sector.

The idea was *not to present a new estimate* of the amount of environmentally harmful subsidies being given.

## UNITE: Net costs of road transport
### Million Euro

<table>
<thead>
<tr>
<th></th>
<th>Infra-structure costs</th>
<th>External (Social) impacts</th>
<th>Total social costs</th>
<th>Total Government revenues</th>
<th>Net effect on revenue</th>
<th>Net social impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C=A+B</td>
<td>D</td>
<td>E=D-A</td>
<td>F=D-C</td>
</tr>
<tr>
<td>Austria</td>
<td>4,382</td>
<td>4,120</td>
<td>8,502</td>
<td>4,923</td>
<td>541</td>
<td>-3,579</td>
</tr>
<tr>
<td>Belgium</td>
<td>1,570</td>
<td>3,828</td>
<td>5,398</td>
<td>6,239</td>
<td>4,669</td>
<td>841</td>
</tr>
<tr>
<td>Denmark</td>
<td>400</td>
<td>1,847</td>
<td>2,247</td>
<td>4,558</td>
<td>4,158</td>
<td>2,311</td>
</tr>
<tr>
<td>Finland</td>
<td>1,119</td>
<td>1,031</td>
<td>2,150</td>
<td>3,626</td>
<td>2,507</td>
<td>1,476</td>
</tr>
<tr>
<td>France</td>
<td>25,520</td>
<td>39,508</td>
<td>65,028</td>
<td>44,016</td>
<td>18,496</td>
<td>-21,012</td>
</tr>
<tr>
<td>Germany</td>
<td>26,176</td>
<td>50,478</td>
<td>76,654</td>
<td>41,416</td>
<td>15,240</td>
<td>-35,238</td>
</tr>
<tr>
<td>Greece</td>
<td>2,802</td>
<td>10,111</td>
<td>12,913</td>
<td>5,520</td>
<td>2,718</td>
<td>-7,393</td>
</tr>
<tr>
<td>Hungary</td>
<td>6,075</td>
<td>2,326</td>
<td>8,401</td>
<td>1,882</td>
<td>-4,193</td>
<td>-6,519</td>
</tr>
</tbody>
</table>

Adapted from UNITE final report, (Nash et al., 2003), page 41 in OECD (2008).
# External Costs of Transport,
By category and mode, EU15 + Norway & Switzerland

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>%</th>
<th>Road</th>
<th></th>
<th></th>
<th>Rail</th>
<th></th>
<th>Aviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Passenger</td>
<td>Freight</td>
<td>Passenger</td>
<td>Freight</td>
<td>Passenger</td>
<td>Freight</td>
</tr>
<tr>
<td>Accidents</td>
<td>156,439</td>
<td>24</td>
<td>136,394</td>
<td>19,194</td>
<td>262</td>
<td>0</td>
<td>590</td>
<td>0</td>
</tr>
<tr>
<td>Noise</td>
<td>45,644</td>
<td>7</td>
<td>21,533</td>
<td>18,877</td>
<td>1,354</td>
<td>782</td>
<td>2,903</td>
<td>195</td>
</tr>
<tr>
<td>Air pollution</td>
<td>174,617</td>
<td>27</td>
<td>55,444</td>
<td>108,838</td>
<td>2,351</td>
<td>2,096</td>
<td>3,875</td>
<td>360</td>
</tr>
<tr>
<td>Climate change, high</td>
<td>195,714</td>
<td>30</td>
<td>69,472</td>
<td>42,911</td>
<td>2,094</td>
<td>800</td>
<td>74,493</td>
<td>5,438</td>
</tr>
<tr>
<td>Climate change, low</td>
<td>27,959</td>
<td>4</td>
<td>9,925</td>
<td>6,130</td>
<td>299</td>
<td>114</td>
<td>10,642</td>
<td>777</td>
</tr>
<tr>
<td>Nature &amp; Landscape</td>
<td>20,014</td>
<td>3</td>
<td>11,105</td>
<td>7,254</td>
<td>202</td>
<td>64</td>
<td>1,211</td>
<td>87</td>
</tr>
<tr>
<td>Up-/Downstream</td>
<td>47,376</td>
<td>7</td>
<td>21,240</td>
<td>22,243</td>
<td>1,140</td>
<td>608</td>
<td>1,592</td>
<td>170</td>
</tr>
<tr>
<td>Urban effects</td>
<td>10,472</td>
<td>2</td>
<td>6,112</td>
<td>3,797</td>
<td>426</td>
<td>137</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>650,275</td>
<td>100</td>
<td>321,301</td>
<td>223,114</td>
<td>7,828</td>
<td>4,487</td>
<td>84,664</td>
<td>6,250</td>
</tr>
</tbody>
</table>

Different theoretical approaches to defining subsidies

- Subsidies stem (only) from Government actions vs. subsidies can originate from society as a whole.
  - Environmental externalities would be treated differently.
- Subsidies are quantified relative to average vs. marginal costs.
  - How much does it cost to provide an additional unit of some type of transport service?
  - From an economic perspective, net wellbeing is maximised when users pay a price equal to the long-term marginal cost.
  - This can, however, lead to reduced public revenues.
Different theoretical approaches to defining subsidies

- **Total subsidies vs. relative subsidies.**
  - Of importance when comparing different modes.

- **Measuring **social** subsidies**
  - Necessary to estimate the magnitude of environmental externalities

- **Measuring **Government** subsidies**
  - On-/off-budget measures (*e.g.* trade barriers, etc.)
  - Only direct expenses or also forgone revenues (*e.g.* tax rate reductions)?
Rather than focusing on a “best” subsidy definition, policy makers should understand why the different definitions exist, and what the policy implications of them are.

It is not required that all policy makers agree on the measurement approach to use, what the “measuring stick” should be, or what should be included in measurements. What is important, is that policy makers understand the approaches that are used.

Total subsidy levels may be meaningful for accounting purposes, in terms of knowing the big picture, how much money is going where, or which industries and transport modes cause the most total damage to society.

If one actually wants to do something about problematic subsidies, then relative subsidies provide a more meaningful indicator.
From a social justice perspective, total social costs vs. total social benefits may be the most appropriate subsidy definition.

From an economic efficiency perspective, a better definition of subsidies is as a failure of users to cover the marginal social cost of their activity. Economic efficiency is maximised when the price a user pays, is equal to the marginal cost that the user imposes, on society as a whole.

If the user-price falls short of marginal social cost, then the difference could be considered the subsidy.

There are, however, also disadvantages of including non-internalised externalities in the subsidy definition.
Focusing too strongly on “subsidies” detracts from the ultimate aim of environmental (or transport) policy – which should be to “improve the wellbeing of the people”.

Policy makers should not lose track of the big picture. The purpose of environmental policy is not to protect or improve the environment at all cost, but rather to ensure that the environment contributes as much as possible to the wellbeing of citizens.

And environmental-transportation policy is not simply intended to reduce the environmental impacts of transport, but to improve the relationship between transport and environment in such a way that the wellbeing of society is enhanced.
“Environmental quality” is currently being produced / maintained at too low levels in many countries.

Rather than asking themselves “which subsidies should be reduced”, policy makers should ask, “where and how can we intervene to improve standards of living”.

The focus should be on government intervention, whether it is classified as subsidy or not.

One should try to find those places in the transport system where marginal social costs are (much) larger than marginal social benefits.

These are the areas where the market is producing too much.

Government support should be decreased in these areas.
Identifying Policies and Programmes for Revision

- **Think Big**: target first areas where the potential for generating benefits is the largest. Focus on activities with a *significant gap* between marginal costs and benefits, and that are *widespread*.

- **Pick Low-Hanging Fruits**: Give priority to problems that can be fixed easily. The less complicated a support mechanism is, the easier can be to reduce it. Changing the value of existing measures is often easier than creating entirely new support structures.

- **Work With Markets**: It is much easier to modify existing markets, than to create a new market. Markets can alter people’s behaviour much more efficiently than direct regulation can, by allowing transport users flexibility to decide for themselves.

- **Apply Direct (Support) Measures**: If e.g. you wish to reduce NO\(_x\) emissions, then develop a policy that targets NO\(_x\) emissions as directly as possible.
CO$_2$-related differentiation of motor vehicle taxes, I: One-off taxes

![Graph showing CO$_2$ emissions and vehicle taxes for various countries.](image)
CO$_2$- related differentiation of motor vehicle taxes, II: Recurrent taxes

Petrol-driven vehicles

- Denmark
- Germany
- Ireland
- Luxembourg
- Portugal
- Sweden
- UK
- France (big polluters)
- France (company cars)
CO₂-related differentiation of motor vehicle taxes, III: Total taxes, per tonne CO₂

- **100 gram CO₂ per km**
- **120 gram CO₂ per km**
- **150 gram CO₂ per km**
- **180 gram CO₂ per km**

*Graphs showing total taxes per tonne CO₂ emitted over the vehicle lifetime for different countries and CO₂ emissions per km.*

- **One-off**
- **Recurrent**
Meta-analysis of Value-of-Statistical-Life estimates

- If one is to assess the marginal social costs of transport activities (e.g. for estimating subsidy amounts), estimates of the economic value of related fatalities are needed.
- With economic support from i.a. the EU Commission, OECD has analysed all VSL estimates derived from stated preferences surveys all over the world, applied in environment, health and traffic risk contexts.
- I.e., people have been asked how much they would be willing to pay for a small mortality risk reduction.
- For EU-wide policies, the study recommends a VSL value of 3.5 million 2005-USD (approximately 3.1 million 2010-€).
When assessing policies, or marginal social costs, in individual countries, one should adjust the EU estimate for differences in income levels, according to the formula:

\[ VSL_p = VSL_s \left( \frac{Y_p}{Y_s} \right)^\beta \]

where \( VSL_p \): value in policy country; \( VSL_s \): EU value; \( Y_p \): income level in policy country; \( Y_s \): EU income level; and \( \beta \): income elasticity of VSL, estimated to be about 0.8.

See [www.oecd.org/env/policies/vsl](http://www.oecd.org/env/policies/vsl) for more information, including all the underlying data.