

# The indirect price effect of environmental taxes: the case of Estonia

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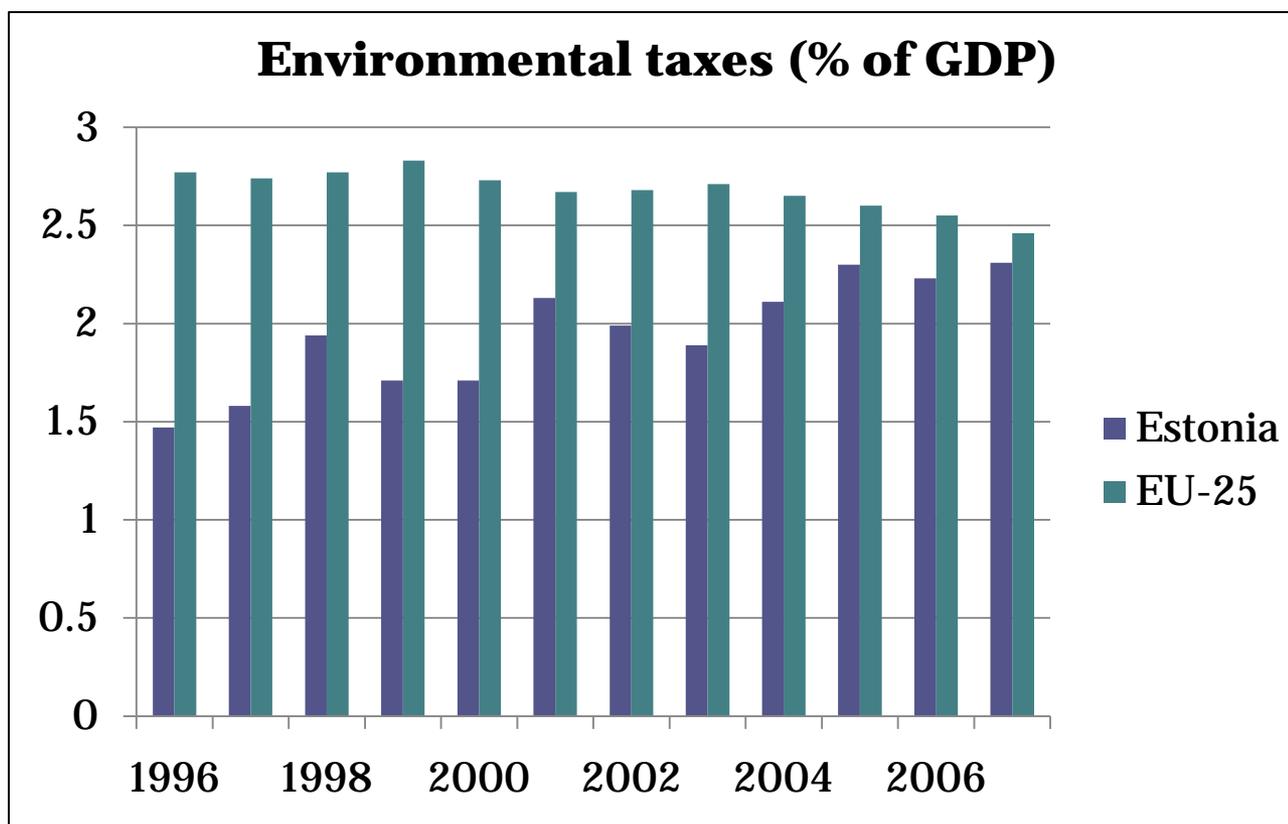
# Background

- **Environmental taxes as a popular instrument to tackle environmental problems**
- **Opposition to environmental taxes:**
  - **Fear of reduced competitiveness**
  - **Bigger effect on low-income households**
- **Different models to study different effects**
  - **For distributional effects: microsimulation**
  - **As this does not capture indirect effect, other methods have to be included, most often I-O table**

# Estonian environmental taxes - 1

- Energy intensity of Estonian economy is very high, exceeding the EU-27 average by more than four times
- Ecological tax reform was initiated in 2005
- Raise of existing taxes and new taxes are to be imposed
- Distributional effects are studied by Poltimäe & Võrk (2008), but do not cover indirect effect

# Estonian environmental taxes - 2



# Estonian environmental taxes - 3

- **Fuel excise**
  - forms 98% of environmental tax revenues (4.3 billion EEK in 2007)
  - mostly motor fuels are taxed
- **Resource & pollution charges** are also used
  - levied on enterprises for resource use (water, forest, mineral resources) and pollution (air, water, waste)
  - 0.84 billion EEK in 2007
  - managed by Ministry of the Environment
  - detailed data not available and therefore not covered in this paper

# Objective of the paper

- To assess the effect of Estonian environmental taxes on the price of goods
- Input-Output table
- Aggregation level is high, therefore only price effects are assessed, not the distributional effects

# Literature overview - 1

- **Studies on the indirect effect of environmental taxes have been done in:**
  - **Canada (Hamilton, Cameron 1994)**
  - **Great Britain (Symons et al 1994)**
  - **Australia (Cornwell, Creedy 1996)**
  - **Spain (Labandeira, Labeaga 1999)**
  - **Denmark (Wier et al 2005)**
  - **the Netherlands (Kerkhof et al 2008)**

# Literature overview - 2

- Studies deal with hypothetical carbon tax
- I-O table to assess the effect on prices
- Results are different:
  - different tax level
  - different aggregation level
- Most of the studies find carbon tax being regressive

# Data and the model

- Fuel use by sectors (2007) – 18 sectors
- Fuel excise rates (2007)
- Input-output table of Estonian economy (2000)  
– 58 sectors

$$TAX^{indirect} = T(I - A)^{-1}$$

# Results - 1

<b>Sector</b>	<b>Share of fuel excise in output (%)</b>
Agriculture and fishing	3.55
Energy	1.94
Mining industry	7.12
Food- and tobacco industry	1.54
Textile and leather industry	0.68
Wood industry	2.45
Paper and printing industry	1.03
Construction	4.31
Land and rail transport	9.00
Water transport	4.87
Air transport	8.00

## Results - 2

- Fuels used by energy sector are not taxed by fuel excise: oil shale, wood, peat not taxed, natural gas taxed since 2008
- Energy sector pays CO<sub>2</sub> pollution charge
- Significant tax changes in 2008, but no data yet to analyse

# Conclusions

- Peculiarities of Estonian tax system hamper environmental tax burden analysis
- Due to the smallness of Estonia, I-O table is very highly aggregated
- Few enterprises in one sector: changes in technology or structural change alters I-O table significantly
- Also behavioral effects need to be considered



Thank you!