A European tax as an EU own resource

Economic-environmental input-output modelling

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• How to estimate tax rates in the economy producing different commodities, where the output of one commodity is used as an input for production of other commodities

• How to quantify the economic effect of introducing CO$_2$ emission tax rates and/or energy consumption tax rate
• „Competitiveness of an economy is not given by simple adding of the activities of the particular industries, but by the complex relationships between them.“ (European commission Brussels, April 2005)

• Input-Output (or interindustry) analysis
  Wassily Leontief – Nobel price in Economic Science in 1973

• Extension of the input-output model by environmental accounts (NAMEA)
• Using data from NAMEA system and the input-output tables the total emission coefficients (total requirements) can be estimated:

\[ r_e = a_e (I - A)^{-1} \]

where \((I - A)^{-1}\) is the Leontief matrix.

• They describe the CO$_2$ emissions generated by production of one unit of particular commodity delivering for final demand.
• $CO_2$ emissions = total requirements per unit of commodity $\times$ amount of final demand

• Similarly the total energy consumption coefficients can be estimated:

• Energy consumption = total energy consumption coefficient $\times$ amount of final demand

• 1% of GNP = $t_1 \times CO_2$ emissions + $t_2 \times$ energy consumption
• Cost push effects by introducing of environmental tax and/or a tax on energy use (per BTU – British thermal units) by applying of the input-output price model

• The commodity prices must be such that they cover the cost of inputs from other sectors of the economy, the cost of primary inputs (labour costs) and the pollution costs.
• Bullard and Herendeen (1975), the impact of tax on energy use:
  – all of the tax would be passed on directly to the consumer
  – the results indicate that the tax would be distributed in such way as to substantially increase the prices of energy-intensive products
  – applied for the US economy based on the 367-sector input-output model
  – combination of input-output and econometric techniques
• Conrad – Schmidt (1998) quantify the economic effects of introducing CO$_2$ reduction policies in the EU using applied general equilibrium models for 11 EU member countries. They analyze:
  – the change in competitiveness for domestic industries
  – the taxes, growth, employment and inflation effects in member countries
  – the cost-effectiveness of a coordinated environmental policy
  – the costs and benefits of a cooperative approach to adhere to an EU target of emissions of air pollutants

• Pollution taxes are used to reduce labour costs ➔ „double dividend“