Evaluating the Impact of A Carbon Tax in Portugal Considering Alternative Assumptions for Price Elasticity of Demand

Topic: (2.7) Input-output analysis for policy making (1)
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In 2015 we presented a paper to the 23rd Input-Output Conference, Mexico City (paper no. 85 in the conference page) with the methodology and results for the evaluation of the macroeconomic, fiscal and environmental impact of the introduction of a carbon tax in Portugal, using a multi-sector macroeconomic model (MODEM 7) combined with an input-output (I-O) price model, considering different levels and scopes for this tax as well as alternative ways of recycling the additional corresponding public revenue. This evaluation was made considering an implicit assumption of zero price elasticity of demand shares (vertical technical coefficients), at constant prices, for intermediate consumption and for householdsâ€™ final demand. While this assumption may be considered acceptable for intermediate consumption (in the short-term), given a certain inertia in production technology response to price changes, it is more questionable for private consumption.
In this paper we present an alternative evaluation of the impact of the carbon tax for the Portuguese economy and environment, considering the assumption that price elasticity of householdsâ€™ real share of each product on total consumption is equal to -1. We describe the methodological changes made to consider this new assumption and compare the results with those obtained from the previous zero price elasticity assumption for private consumption. An improvement is also made and presented regarding the method for estimating the impact of the carbon tax on CO2 emissions.
Both MODEM 7 and the I-O price model consider 85 homogenous industries and were calibrated using a system of symmetric I-O tables and other recent macroeconomic and environmental data available for Portugal, from official sources.