An Environmental Input-Output Stock-Flow Consistent Model for the Danish Economy

Topic: Special Session - Assessing Industrial, Trade and Green Transition Policies Through SFC-IO Models
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The main objective of this project is to develop an empirical environmental input-output stock-flow consistent model for the Danish economy (EMDE) to test and understand a wide variety of policies with the goal of identifying the different paths that Denmark can take in towards the green transition and pursuit the goal of being carbon neutral in 2050. To do so, we use the detailed IO-tables across time provided by Denmarkâ€™s statistics to develop an environmental SFC-IO model for the Danish economy. The Stock Flow Consistent approach offers a consistent methodology that relates stocks and flows by way of social accounting and flow-of-fund matrices. We extend the existing SFC framework by integrating a full set of Input-Output (IO) tables, into the modeling framework (see, e.g., Berg et al (2015) and Naqvi (2015), Jackson (2019), Jackson & Jackson (2021)). As this is an empirical model, we first ensure that the detailed IO-tables provided by Statistics Denmark match aggregate measures in the national accounts. Second, we deflate the IO-tables to 2010 prices, using the IO-data available both in current and last yearâ€™s prices. The deflated IO-tables allow us to differ between price shocks and unit shocks going through the IO-framework within the model. Third, we integrate environmental accounts into the modeling framework using industry level data provided by statistics Denmark. The model is pre-dominantly demand led in a sense that behavioral equations determine aggregate demand, which then through the IO-framework will determine the supply side. This paper will provide a thorough description of the equations used within the model to set up a dynamic IO framework, consisting of 7 industries, which is then aggregated to model the non-financial sector in the economy. We evaluate the model based on its ability to match actual data. Finally, we perform two shocks in the model, i) a demand shock that is introduced through an increase in government spending, and ii) The cost push shock introduced through an increase in import prices as was experienced by Denmark during the Covid-19.