The Circular Economy in General Equilibrium

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Abstract

The scarcity of raw materials and the pollution associated with material excavation and disposal motivate a move from a linear to a circular economy. To analyse policies that facilitate this move, we develop an economic computable general equilibrium (CGE) model featuring waste generation, an elaborate waste treatment sector, and the possibility of substituting virgin and recycled materials. We calibrate the model to the Danish economy where comprehensive data on waste generation, sorting, and treatment are available. The waste treatment sector is calibrated using an advanced recycling model from environmental engineering, while the substitution of virgin and recycled materials is based on Material Flow Accounts. Our novel method enables us to analyse waste management policies, taking general equilibrium effects, realistic recycling possibilities, and complex dynamics within waste treatment into account using a unified framework.

Keywords: Circular Economy; Optimal Recycling

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