

An extended multiregional IO model to measure the energy impacts of telework

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Extended abstract

Teleworking is arguably one of the most notable effects of the digital transition in developed countries. After the COVID-19 pandemic, it seems that telework will stick, at least to some extent (Barrero et al., 2021). A number of studies have assessed the energy impacts of telework (Hook et al., 2020). The results show counteracting trends: the reduction of energy consumption in daily commutes might be compensated by increasing demand of energy-intensive consumption goods or amenities (Larson & Zhao, 2017).

In this paper we relax some of the assumptions behind energy impact assessments of telework. Regarding job-residential location choices, we follow Delventhal et al. (2022) and need not assume monocentric cities. Different from Delventhal et al. (2022), preferences for local amenities are not fixed; rather, they are an increasing function of telework intensity. Regarding production and consumption, we relax some of the rigidities in Computable General Equilibrium models so that some Keynesian multiplier effects may appear (Kratena, 2024). Our model disaggregates household consumption by region and degree of urbanisation. Each commodity has its own energy consumption coefficient per unit of output.

We calibrate our model to replicate the Austrian multiregional economy in 2021. We then shock our model restricting telework and simulating an alternative set of job-residential location choices. Individual choices result in alternative aggregate household consumption and labour supply. The model is solved iteratively until reaching a new equilibrium, thus providing alternative regional energy consumption levels as well. We interpret the gap between the observed and alternative energy consumptions as the energy impacts of telework.

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