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## ZSUZSANNA ZSIBÓK: CLIMATE EFFECTS AND CIRCULAR ECONOMY IN LONG-RUN ECONOMIC MODELLING

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During the past decades the economic literature has recognised the role of environmental factors, especially climate change, on the long-run economic development, although these issues have only rarely appeared in economic models. Stern's seminal report (Stern, Nicholas, 2006: Stern Review on the Economics of Climate Change, HM Treasury, London) established a new economic strand of research, the so-called climate change economics which is methodologically centred on integrated assessment modelling. This method is "integrated", since environmental problems appear across several disciplines, and "assessment", since it aims to serve policy decision-making through numerical models. Economic models, especially cost-benefit analyses, integrate climate change with the help of special variables such as the mitigation costs or the energy use. Usually, forecasts are made on the basis of two types of scenarios: one is a business-as-usual scenario which assumes unchanged behaviour of the economic actors, providing a reference scenario. This baseline scenario is contrasted to one or more additional scenarios that reflect certain climate policy interventions. Concerning circular economy, modelling efforts study the macroeconomic effects of a potential transition towards a circular economy (which involves, according to the OECD, reduced demand for certain natural resources, and the materials that are derived from them). This transition can be characterised by a more efficient resource use, according to which an improved economic performance can be realised with the same or less resource use. A special feature of circular economy modelling is that many aspects of a circular economy transition are "out of sample", that is, very little historic experience is available in this field. Many of the studies available in the literature of circular economy modelling were prepared in 2015 or later, and most of them use computable general equilibrium (CGE) models and macro-econometric models, as well as global and national input-output models (material flow analysis). Current economic models are built relying heavily on historic correlations (in a linear economy) between different sectors. This approach has inherent limitations when modelling the circular economy with very different relationships between sectors. Our research intends to review the existing economic modelling techniques related to

climate change and circular economy with a special focus on regional models. We show that although more and more researches deal with climate change, the regionalisation of the models remains scarce – often, models operate with world regions and not subnational regions.

*Acknowledgement:* Project no. 120004 has been implemented with the support provided from the National Research, Development and Innovation Fund of Hungary, financed under the K\_16 funding scheme.

*KEYWORDS:* *economic modelling, circular economy, climate change*