Empirica (2014) 41:377–380
DOI 10.1007/s10663-014-9269-8

EDITORIAL

Special issue: Selected papers of the WWWforEurope conference on modelling growth and socio-ecological transition, Vienna, 2013

Margit Schratzenstaller · Teresa Weiss · Sigrid Stix

Published online: 19 June 2014

In the aftermath of the Great Recession, long-run issues about planetary boundaries, progressing environmental degradation, emerging inequality and poverty have been partly displaced by short-run issues as, for example, income losses, unemployment and social problems. From a European policy perspective these issues need to be considered simultaneously. This was the main topic of the conference "Modelling Growth and Socio-Ecological transition" organised within the 7th Framework Programme project "WWWforEurope".

So far, the majority of current growth models focus on traditional growth drivers (e.g. total factor productivity), incorporating environmental boundaries only on an aggregate level in a simple specification. They do not take into account that the (growing) economic system cannot be considered separately, but is embedded in a social system that is part of an environmental system itself. In order to tackle the challenges mentioned above and to move towards a more economically dynamic, socially inclusive and environmentally sustainable European society/economy a socio-ecological transition is needed. The availability of models incorporating social and environmental dimensions is an important prerequisite to objectively and realistically evaluate potential consequences of such a transition. Particularly, the intended but also non-intended economic, social and environmental effects of different economic instruments and policy options related to a socio-ecological transition need to be identified.

On March 12th and 13th, 2013, the Austrian Institute of Economic Research (WIFO) addressed this important topic at a Conference on "Modelling Growth and Socio-ecological transition" in Vienna, where the participants presented, compared and discussed existing and yet to be developed economic models that also consider

M. Schratzenstaller · T. Weiss (✉) · S. Stix
Vienna, Austria
e-mail: Teresa.Weiss@wifo.ac.at

social and environmental aspects and variables. The conference is part of the project "Welfare, Wealth and Work for Europe" (WWWforEurope)[1] which is a 4 year research project within the 7th Framework Programme funded by the European Commission. The research consortium is coordinated by the Austrian Institute of Economic Research and brings together researchers from 33 scientific institutions in 12 European countries with a broad interdisciplinary expertise including economics, ecology, history, demography, political science and gender research. Starting point of the project is the conviction that Europe needs a change towards a new growth and development path. This new path is based upon a definition of growth in terms of welfare beyond GDP, respecting social and environmental priorities as drivers of growth. The aim of the research project is to investigate the potential conflicts and trade-offs, but also the synergies between macroeconomic performance (notably employment and competitiveness), environmental sustainability, as well as social indicators (welfare, equity). The vision is that Europe should become a role model for a growth strategy which actively incorporates social and environmental goals as well as high employment, gender equality and cultural diversity in an ambitious, forward looking way.

It was the aim of the conference to promote the exchange of ideas among researchers active in various fields of applied economic modelling that may contribute to the overall goal of investigating the economic, social and environmental consequences of deviations from the current growth path in the direction towards a socio-ecological transition. The presented modelling approaches included different economic modelling disciplines such as agent-based modelling, evolutionary game theory, system dynamics modelling, macroeconomic modelling including credit creation and the private banking system, data envelopment analysis (DEA), and discrete choice modelling. Additionally two inspiring keynotes on the "Chances and Challenges of Modelling Growth and Socio-Ecological Transition" were held by Graciela Chichilnisky (Columbia University) and Jan Rotmans (Erasmus University Rotterdam, DRIFT)[2] who presented their views on carbon markets and transition models.

Four of the conference papers are now published in this special issue of Empirica, comprising a wide range of relevant modelling approaches briefly sketched in this introduction.

In "A simple model of income, aggregate demand and the process of credit creation by private banks" Giovanni Bernardo and Emanuele Campiglio present a simple macroeconomic model that describes the main mechanisms of the process of credit creation by the private banking system. The model consists on the one hand of a core unit sketching the dynamic mechanisms of income, debt and aggregate demand. In this part an ex-ante wedge between current income and planed expenditure is introduced which can be only filled by private banks through the creation of new credit. On the other hand the agents that populate the economy (i.e. non-financial firms, central bank, households and gilt sellers) are represented

[1] For more information see www.foreurope.eu.

[2] The presentations by Graciela Chichilnisky and Jan Rotmans are available under the link http://www.foreurope.eu/index.php?id=803.

through a set of sectoral accounts. Due to the modelling approach, Bernardo's and Campiglio's framework is able to grasp the crucial features of the credit creation mechanics and its relations to the expansion of economic activity. The authors argue that their model can be seen as an analytical representation of Hyman P. Minsky's idea that economic systems need to have expenditure plans exceeding current income in order to grow. With their attempt to take into account some macroeconomic variables that played a major role in the development of the financial crisis, the authors contribute to recent literature by trying to improve macroeconomic theory that systematically excludes money, debt and credit.

Martin Lábaj, Mikulas Luptáčik and Eduard Nežinský contribute to the debate on measuring economic performance in terms of welfare beyond GDP by applying a non-parametric approach. They extend a DEA model with environmental and social indicators in order to measure so called eco-efficiency and to take social performance into account. By testing various model specifications capturing different characteristics of economic development, they demonstrate different options for economic policy to increase efficiency. The authors apply their theoretical considerations on 30 European countries (27 EU countries + Iceland, Norway and Switzerland). The empirical results show the strengths and weaknesses of these countries in different indicators.

Andreas Rainer and Rita Strohmaier analyse the economic and social consequences of General Purpose Technologies (GPTs) by merging a Neo-Ricardian multi-sector framework with the replicator dynamic formalism of evolutionary game theory. Their results show that new GPTs pave the way for process innovations and that technical change within a GPT sector influence productivity gains in related sectors. They also observe social consequences such as changing wage share, technical unemployment and transitional unemployment. The empirical evidence for their theoretical contribution is given by using Danish ICT (information and communication technologies) sector data and a structural decomposition analysis which allows the elaboration of inter-sectoral linkages by using an evolutionary multi-sector model. The analysis of the diffusion of GPTs is relevant insofar as these are basic innovations that change the production structure of the economy via their pervasive use.

Andrea Stocker, Anett Großmann, Friedrich Hinterberger and Marc Ingo Wolter discuss the implications of a persistent low growth path for Austria by applying a scenario analysis combined with macro-econometric modelling based on the Austrian model e3.at. By measuring growth in terms of GDP, the authors examine how the Austrian economy and society can cope with long-lasting low economic growth. The comparison of a "reference scenario" based on an average growth rate of GDP by 2.0 % per annum with a "low growth scenario" based on an average growth rate by 0.55 % shows that the macroeconomic consequences of low growth in Austria would be considerable. For instance, the labour market would suffer from shortages of labour supply due to reduced migration and from reduced demand for labour due to less demand in consumption, investments and exports. From an ecological perspective the paper shows that a persistent low growth path in Austria would slow down resource consumption growth, but not in absolute terms. Therefore, the authors cannot conclude that a low growth path necessarily would

facilitate the achievement of energy and environmental policy goals. A "policy scenario" further highlights that the introduction of appropriate policy measures such as the reduction of working time, an eco-social tax reform, a reduction of environmentally harmful subsidies, and the stimulation of the private demand for services could reduce the negative consequences of persistent low growth.

Overall, this special issue of Empirica gives insights into the broad spectrum of research that tackles the modelling of smart, sustainable and inclusive growth. The selected papers include modelling approaches that examine the implications of credit creation in the private banking sector on the expansion of economic activity, investigate alternative measures of economic performance in terms of welfare beyond GDP, analyse the economic and social consequences of introducing General Purpose Technologies, and discuss the implications of a persistent low growth path for Austria. The Editors hope that the selected articles make this special issue a valuable and useful contribution to modelling frameworks that consider growth and socio-ecological transition and for current and future policy debates. Nevertheless further research on this topic is required in order to clearly identify the trade-offs and synergies of economic growth, social wellbeing, and a stable environmental system.

Acknowledgments We would like to thank Kurt Kratena (Austrian Institute of Economic Research) for his useful advice and his support in guest-editing this special issue. Furthermore we want to thank Nadine Fetzer who also contributed to this special issue during her stay as a Junior Fellow at the Austrian Institute of Economic Research.