Microsimulation Workshop: Women in Statistics

As a part of the Statistical Week 2019 at Trier University

September 9, 2019

Content

Under the direction of Petra Stein (University of Duisburg-Essen), the MikroSim research group is organizing a microsimulation workshop by female researchers for female researchers. The aim of this workshop is to demonstrate diverse possibilities of microsimulations and to unfold the advantages of using computational microsimulation modeling through practical exercises. First, we will give a short introduction to microsimulation modeling and present the novel german microsimulation project MikroSim. Second, Katrin Gasior will introduce the powerful toolkit of EUROMOD, which allows for conducting microsimulations of different European countries. After that, we will get to know a specific microsimulation R Package (MicSim) developed by Sabine Zinn.

Venue/Registration

The workshop will take place as a part of the Statistical Week on the 9th of September 2019 at Trier University. It especially addresses PhD and Master's students and will be held in English. Participation is free of charge. To register for the workshop send an e-mail with the subject "Microsimulation Workshop – Women in Statistics" to:

mikrosim@uni-trier.de

In addition to this, please write us your name, university/institution, course of study and degree. We will reply to your e-mail in order to confirm your registration. As the number of participants is limited, we recommend registering early.

Workshop outline

09:30 – 10:00   Get-together & coffee

10:00 – 10:30   Welcome & introduction to microsimulation modeling
Petra Stein & Monika Obersneider (University of Duisburg-Essen)
Kristina Neufang (Trier University)

10:30 – 12:30   Opening the black box: A short introduction to tax-benefit microsimulation
and its applications using EUROMOD (Part I)
Katrin Gasior (University of Essex)

12:30 – 13:30   Lunch break

13:30 – 15:30   Opening the black box: A short introduction to tax-benefit microsimulation
and its applications using EUROMOD (Part II)
Katrin Gasior (University of Essex)

15:30 – 15:45   Coffee break

15:45 – 17:00   Simulating Life Histories with the R Package MicSim
Sabine Zinn (DIW Berlin)

Introduction to microsimulation modeling by Petra Stein, Monika Obersneider and Kristina Neufang

The main underlying concept of microsimulations is to model the actions and interactions of micro-level units (e.g. individuals or households) to study their effects concerning macro-level changes and possible future developments. We will define and give examples of static, dynamic and spatial models and discuss methodological aspects of performing microsimulations. Furthermore, the development of a nation-wide regional microsimulation infrastructure by the research group FOR 2559 "Multi-Sectoral Regional Microsimulation Model" (MikroSim) funded by the German Research Foundation (DFG) will be presented. Researchers of Trier University and the University of Duisburg-Essen are working in close cooperation with the German Federal Statistical Office to realize the project covering technical issues (creation/projection of the base population) as well as theoretical aspects (family and care/integration of migrants).

Opening the black box: A short introduction to tax-benefit microsimulation and its applications using EUROMOD by Katrin Gasior

Tax-benefit models are used to answer "what if" questions about the effects of tax and benefit reforms on household incomes. The workshop is an opportunity to look inside the "black box" of microsimulation models and to learn about EUROMOD, the tax-benefit microsimulation model of the EU. The model is unique in two ways: its software and country models are freely accessible and it allows for comparative research. The workshop provides an introduction to (static) tax-benefit microsimulation models and their use for single country as well as comparative research. The first part of the workshop will focus on the EUROMOD model - its user interface and features. The second part will focus on research applications using the model. Participants will also have the chance to use the model in a small hands-on exercise.

Simulating Life Histories with the R Package MicSim by Sabine Zinn

This lecture illustrates how synthetic life-courses can be simulated by the use of continuous-time microsimulation. To perform a microsimulation we use the MicSim package of the open source software environment R. This lecture will be structured as follows: first, I introduce the basic concepts of a continuous-time microsimulation approach. In a second step, I will show how to conduct continuous-time microsimulation using the MicSim package. To illustrate the functionality of the package I will use two examples: first, we study living arrangement pathways to first birth. Second, we study a more complex application on individual behaviour concerning changes in marital status, educational attainment, and fertility status. For the first application on living arrangement pathways to first birth we use empirical rates derived from the Dutch SHARELIFE survey and for the second application we use with hypothetical transition rates resembling real behaviour in Western societies. I will conclude this session with some remarks on how to build feasible computer experiments via simulation. That is, I will shortly present the key idea of a pseudo random number generator, seed setting, and the necessity to repeat simulation runs. Finally, I will illustrate MicSim's abilities to shorten run times by conducting multi-core simulations.