RAS and Related Balancing Techniques: An Introduction with Examples in R

Lecturer: Dr. Mattia Cai

Organisation for Economic Co-operation and Development (OECD)

Summary of the Training Session:

Input-output databases must adhere to strict accounting identities but compiling them often requires integrating data from multiple sources, which rarely align perfectly. Discrepancies can arise due to inconsistencies between data sources, measurement errors, or the need for missing data imputation. It then becomes necessary to resolve such accounting inconsistencies, i.e., to 'balance' the database. A widely used balancing technique is the RAS algorithm, which iteratively adjusts the entries of an initial matrix until they match predetermined row and column totals. The RAS method is popular because it is straightforward to implement, computationally inexpensive, and performs well across a range of scenarios. This module offers a hands-on introduction to the RAS algorithm and its key extensions (e.g. GRAS for handling negative entries) with a strong emphasis on intuitive explanations and practical examples. The exercises in this module will be conducted using R.

Outline:

First Session *A gentle introduction to the RAS algorithm in R*

Second Session *Popular applications of the RAS algorithm I*

Third Session *Popular applications of the RAS algorithm II*

Fourth Session *Extensions (GRAS, KRAS, multidimensional balancing,…)*

Prerequisites:

Participants will bring with them their laptops with R already installed.

Suggested References:

Miller, R. E., & Blair, P. D. (2022, Chapter 9). Input-output analysis: foundations and extensions. Third edition. Cambridge University Press.

Selected examples from recent literature (to be determined)