



Pre-Congress Workshop 29th August 2023, morning

Congress venue Couvent des Jacobins, Rennes

WS07 – Production, Productivity, and Efficiency Analysis with Stochastic Frontier Methods in R

General information

Full title: Production, Productivity, and Efficiency Analysis with Stochastic Frontier Methods in R

Length: 4 hours (including coffee break)

Organiser(s)

Arne Henningsen (IFRO, University of Copenhagen) and Hervé Dakpo (INRAE, PSAE)

Objectives

The workshop will give a brief introduction to empirical analyses of production processes, productivity, and efficiency with stochastic frontier methods in R. In addition to traditional stochastic frontier models using cross-sectional data, it will also cover heteroskedasticity in the noise and/or inefficiency term, latent-class stochastic frontier models, sample-selection stochastic frontier models, and zero-inefficiency stochastic frontier models as well as modelling undesirable (“bad”) outputs. The workshop will also cover some panel stochastic frontier models (e.g., time-invariant and time-varying inefficiencies, panel latent class stochastic frontier).

Format

For each of the methods covered in this workshop, the workshop organisers will briefly describe the theory behind the method and then explain how the method can be used for empirical analyses in R. Then, the workshop participants will (individually or in small groups) apply the method to real-world data on their computers and discuss the empirical application and the results with other workshop participants. The workshop organisers will assist the workshop participants with their empirical analyses and monitor the group discussions and guide these discussions if necessary. This will be repeated for each of the covered methods / topics (see above).

At least two weeks before the workshop, the participants of the workshop will receive a ‘reading list’ so that they can make sure that they are familiar with the methods that will be taught at this workshop.

Intended audience and required material

Researchers and analysts at all levels in academia or in the private or public sector who would like to learn or improve their skills to empirically analyse production technologies, productivity, and/or efficiency with various stochastic frontier methods in R, potentially taking into account undesirable outputs such as GHG emissions, air pollution, nitrogen pollution, etc. It would be beneficial for the participants if they have a basic prior knowledge of simple stochastic frontier methods and the R statistical software (e.g., using the command ‘lm’ for linear regression). In order to work (individually or in small groups) on the exercises / empirical analyses, at least every second participant should bring a laptop computer to the workshop with recent versions of R (<https://cran.r-project.org/>) and RStudio Desktop (<https://posit.co/download/rstudio-desktop/>) installed.