UNIVERSITY OF OXFORD
Grand Union Doctoral Training Partnership

Introduction to Longitudinal Data Analysis with R (4h Workshop)

Academic Year: 2025-26

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Introduction

This workshop offers a hands-on introduction to panel and longitudinal data analysis using R. It is designed for social scientists who wish to move beyond cross-sectional methods and work effectively with repeated observations of individuals, organisations, or countries. Emphasis is placed on practical skills, modelling, model interpretation, and recognising the strengths and limitations of key longitudinal approaches used in contemporary research.

Objectives

By the end of this workshop, participants will:

- Understand the logic and structure of panel and longitudinal data.
- Know when LDA is appropriate for answering causal and descriptive research questions.
- Be able to prepare, clean, and organise panel datasets in R.
- Implement basic Fixed Effects and Random Effects models to address unobserved heterogeneity.
- Conduct basic model diagnostics and compare alternative specifications.
- Apply longitudinal methods to real datasets and interpret results in a social-scientific context.

Syllabus

- Panel data fundamentals: structure, advantages, common sources, and typical challenges.
- Preparing longitudinal data in R: data reshaping, cleaning, indexing, and handling missingness.
- Introduction to longitudinal modelling: unobserved heterogeneity, within–between variation, and time-varying vs time-invariant predictors.
- Fixed Effects models: assumptions, estimation, interpretation, and extensions.
- Random Effects models: assumptions, estimation, interpretation, and comparisons with FE.
- Model selection and diagnostics: Hausman test, goodness-of-fit considerations, and robustness checks.
- Applied case studies

Structure and Format

Duration: 4-hours
Format: In-person / (hybrid)
Location: University of Oxford

Prerequisites

Participants should have a basic working knowledge of R for data manipulation and regression modelling and be familiar with Ordinary Least Squares (OLS) regression and hypothesis testing.

The workshop will use R for all exercises and examples.

Before the workshop, please ensure you have installed R, RStudio, and the following R packages:

```
c("RColorBrewer", "fixest", "forcats", "haven", "janitor", "lme4",
"lubridate", "plm", "readxl", "srvyr", "stargazer", "tidyverse", "viridis")
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