Ph.D. in "Life Course Research" – Socio-demographic curriculum

Academic Year 2025-2026

Longitudinal data analysis

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Objectives

Micro panel data contain information on many cross-selection units (usually individuals) observed at regular time points (usually every year). The first part of the course will introduce the rationale and functioning of panel data and the main techniques required for regression-based panel data analysis. The second part of the course, will present advanced panel estimators and the most recent developments in panel data analysis.

The aim of the course is to provide students the skills necessary to understand and assess the application of micro panel data analysis reported in the applied sociological and economic literature; and to enable participants to apply micro panel data techniques to their own research questions.

Program

Monday 12/1/2026 (G. Cutuli):

- Introduction on panel data: What are panel data? Why use panel data? Handling panel data in Stata – some basic commands. Patterns of observations in panel data (non-response and attrition). Within and between variation. Transitions.

Tuesday 13/1/2026 (G. Cutuli):

- Regression analysis: Inference using panel data. Unobserved heterogeneity. Within and between group regression (a brief guide on assumptions and use). Random effects regression. Fixed effects regression. Testing the FE and RE assumptions. Hausman test. Mundlak approach and related (hybrid) models.
- Alternative use of repeated cross sections: pseudo-panels and related models.
- Binary response models: Conditional (fixed-effects) logit. Random effects probit and logit.

Wednesday 14/1/2026 (R. Grotti):

- Advanced panel estimators: FEIS: Fixed-Effects Individual Slope models. Dynamic models for continuous outcome. Dynamic models for binary outcomes.

Thursday 15/1/2026 (R. Grotti):

- Longitudinal analysis in a multilevel framework: Growth curve models. Splines. Effects heterogeneity.
- Further developments in longitudinal analysis: Interactions in Fixed Effects Regression Models

Suggested lecture

Halaby, C. (2005) Panel Models in Sociological Research: Theory into Practice, Annual Review of Sociology, 30:1, 507-544

Requirements

The course is practical and requires some familiarity with quantitative methods and the statistical software Stata.

Other useful readings

Allison, P. (2009) Fixed Effects Regression Models, Vol. 160. Los Angeles: Sage (FE)

Bell, A., Jones, K. Fairbrother, M. (2016) Fixed and Random effects models: making an informed choice. Working Paper. (REWB)

Baum, C. F. (2009). An introduction to Stata programming. College Station: Stata Press.

Biegert, T. (2017) Welfare benefits and unemployment in affluent democracies: the moderating role of the institutional insider/outsider divide. American Sociological Review, 82 (5). pp. 1037-1064 (PSEUDO-PANEL)

Borgen, N. (2016) Fixed effects in unconditional quantile regression," Stata Journal, StataCorp LP, vol. 16(2), pages 403-415, June. (UQFE)

Brüderl, J., Ludwig, V. (2012) Useful Stata Commands for Longitudinal Data Analysis (STATA)

Brüderl, J., Ludwig, V. (2015) Fixed-effects panel regression, Sage Handbook Regression Analysis and Causal inference (FE, FEIS, GC)

Brüderl, J., & Ludwig, V. (2015). 'Fixed-effects panel regression. The Sage handbook of regression analysis and causal inference', in Best, H., & Wolf, C. (Eds.). (2015). The SAGE handbook of regression analysis and causal inference. Sage., pp. 327-357.

Cantalini, S., Härkönen J. Dahlberg, J. (2017) Does postponing Pay Off? Timing of Parenthood, Earnings Trajectories, and Earnings Accumulation in Sweden 1990-2012 (FEIS)

Cox, NJ, and HJ Newton, eds. (2014). One Hundred Nineteen Stata Tips. College Station: Stata Press.

Hai-Anh,D. Lanjouw, P., Luoto, J., McKenzie.D. (2014) Using Repeated Cross-Sections to Explore Movements in and out of Poverty". Journal of Development Economics, 107: 112-128

Giesselmann, M., & Schmidt-Catran, A. W. (2020). Interactions in fixed effects regression models. Sociological Methods & Research, 0049124120914934.

Grotti, R., Cutuli, G. (2018) Xtpdyn, a community contributed command for fitting dynamic random effects probit model with unobserved heterogeneity using Stata, The Stata Journal, (4) 2018 (GSD-UH)

Longhi, S., Nandi, A. (2015) A practical guide to Using Panel Data (PANEL INTRO)

Ludwig, V., & Brüderl, J. (2018). 'Is there a male marital wage premium? New evidence from the United States'. American Sociological Review, 83(4), 744-770.

Manzoni, A., Härkönen , J., & Mayer, K. U. (2014). Moving on? A growth curve analysis of occupational attainment and career progression patterns in West Germany. Social Forces, 92(4), 1285 1312.

Rabe-Hesketh, S. Skrondal, A. (2012) Multilevel and Longitudinal Modeling Using Stata, Stata Press

Wooldridge, J. M. (2005) Simple solutions to the initial conditions problem in dynamic, nonlinear panel data models with unobserved heterogeneity. J. Appl. Econ., 20: 39–54 (GSD)

Snijders , T. A., & Bosker, R. J. (2011). Multilevel analysis: An introduction to basic and advanced multilevel modeling. Sage