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Title:
Panel-data modelling using structural mean models

Abstract:
Structural mean models (SMMs) are a class of semiparametric models originally designed for the estimation of causal effects of treatment regimes based on data from randomized clinical trials in which there was patient noncompliance. Until now, SMMs have not been used for modelling longitudinal panel data. We use SMMs to estimate the causal effect of employment status on mental health from the British Household Panel Study (BHPS). Estimation of these models using the generalized method of moments (GMM) is considered both with and without the assumption of no unobserved confounding. The substantive focus is on the effect of changes in employment status on mental health, which requires the use of extended SMMs which satisfy a second-order Markov assumption. Fully and locally efficient estimators are derived for this family of models. We also explore different strategies for specifying the potentially complex auxiliary for estimation. Our results are compared with those obtained using alternative types of panel-data model.