



# Bayesian modelling of treatment effects on panel outcomes

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Identification and estimation of treatment effects is an important issue in many application fields, e.g. to evaluate the effectiveness of social programs, government policies or medical interventions. In randomized studies treatment effects can be estimated based on a comparison of the outcome of interest in the treatment and the control group. However, for data from observational studies endogeneity of treatment selection might cause unobserved confounding thus requiring more sophisticated methods.

The Bayesian approach to analysis of treatment effects from observational data relies on a joint model of treatment selection and the potential outcomes under treatment and control conditions. For the estimation of dynamic treatment effects on a continuous outcome observed over subsequent time periods two models, the switching regression model and the shared factor model, have been suggested so far. I will show that both impose restrictions on the joint correlation structure of treatment selection and the two potential outcomes sequences which can result in biased treatment effects estimates. To achieve more flexibility I propose a new model that allows to separate longitudinal association of the outcomes from association due to endogeneity of treatment selection.

The models are employed to analyse the effects of a long (vs. a short) maternity leave on earnings of Austrian mothers, where we exploit a change in the parental leave policy in Austria that extended maternal benefits from 18 months since birth of the child to 30 months. The analysis is based on data from the Austrian Social Security Register which contains individual employment histories since 1972 and also reports number of births and maternity and parental leave spells for all Austrian employees.