

## Microeconometric Evaluation of Multiple and Continuous Treatments

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### Project Team:

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### Project Results:

During the funding period we were able to finalize two research papers:

[Pohlmeier, Winfried and Seiberlich, Ruben and Uysal, S. Derya \(2014\) A simple and successful shrinkage method for weighting estimators of treatment effects. Computational Statistics & Data Analysis. \(Published before print\)](#)  
[DOI: 10.1016/j.csda.2014.09.015](#)

[Uysal, S. Derya \(2014\) Doubly Robust Estimation of Causal Effects with Multivalued Treatments: An Application to the Returns to Schooling. Journal of Applied Econometrics. \(Published before print\)](#)  
[DOI: 10.1002/jae.2386](#)

Additionally, our work has been presented in the following international conferences and workshops:

Doubly Robust Estimation of Causal Effects with Multivalued Treatments

- European meeting of the Econometric Society, August 2013, Gothenburg, Sweden
- German Statistical Week (Statistische Woche), September 2012, Vienna, Austria
- Annual Congress of Verein für Socialpolitik, September 2012, Göttingen, Germany
- Econometric Society Australasian Meeting, July 2012, Melbourne, Australia
- European Society of Population Economics, June 2012, Bern, Switzerland

Shrink your Weight: Improving Propensity Score Weighting Estimators

- European Meeting of the Econometric Society, August 2012, Málaga, Spanien
- German Statistical Week (Statistische Woche), September 2012, Vienna, Austria
- DFH Workshop "Applied Econometrics" March 2012, Königfeld, Germany

### Summary of Proposed Research:

Estimation of treatment effects under the Conditional Independence Assumption (CIA) for the case of a binary treatment variable is heavily investigated in the literature. Imbens (2004) and Imbens and Wooldridge (2009) give very comprehensive reviews of the existing econometric methods for binary treatment models. These methods can be applied to estimate, for example, the effect of active labour market policies or the effect of any variable which can be considered as a treatment variable, such as schooling. Although binary treatment covers many applications, there are examples where a binary treatment variable is not sufficient to deal with all possible treatment values.

If the interest lies on the effect of different doses of a treatment (i.e. multivalued treatment) or on the effect of a treatment variable which is continuous, one has to use more sophisticated methods than the methods for binary cases. The literature on multivalued treatment as well as continuous treatment is much more recent. The pioneering works by Imbens (2000) and Lechner (2001) on multivalued treatment models and Hirano and Imbens (2004) on continuous treatment models are followed by some applications of the methods and methodological extensions. As there are some rather specific treatments with considerable policy importance, there is room for a substantial refinement of existing methods.

A second important aspect is robustness of applied methods: while all of typically used methods require very specific assumptions for identification of a treatment effect, in many cases these are not testable. There is room for robust estimation techniques, techniques requiring less stringent assumptions: Doubly robust methods are methods using a combination of approaches of which only of them has to be strictly identified.

The broad objective of our proposal is (i) to extend the existing econometrics methods for multivalued treatment models for more flexible treatment variable structure, (ii) to develop more robust, i.e. doubly robust, estimation methods for the continuous treatment model, (iii) to apply developed econometric methods to economically relevant evaluation problems from labour economics.