Dominik Liebl

Academic career

2003 - 2008	Undergraduate Studies in Economics, University of Bonn and Charles University, Prague, Czech Republic
2008 - 2010	Scholar, Cologne Graduate School (CGS)
2010	Research Stay at the Working Group STAPH, Paul Sabatier University (Toulouse III), France
2010 - 2013	Research Assistant, Institute for Econometrics and Statistics, University of Cologne
2013 - 2014	Postdoctoral Researcher, European Center for Advanced Research in Economics and Statistics (ECARES), Université Libre de Bruxelles, Belgium
Since 2014	Assistant Professor for Statistics, Institute for Financial Economics and Statistics, University of Bonn

Research Projects and Activities

Functional data analysis, semi- and nonparametric statistics, and panel data analysis.

Research profile

My research is focused on a relatively new branch of statistics called Functional Data Analysis (FDA). FDA emerged from the availability of function-valued data and the need to analyze such data appropriately. Like classical multivariate data, functional data can occur as cross-sectional, autocorrelated or spatially correlated data, but the structure of functional data is fundamentally different from that of classical multivariate data. This allows for some unique possibilities, such as the statistical analysis of derivatives or differential equations. There are, however, also some challenging properties such as the high dimensionality of the data. A particular focus of my research is the relevant practical situation in which we do not directly observe the functions, but only their noisy discretization points. These situations typically involve the use of nonparametric estimation procedures.
My future research plans focus on reconstructing partially observed functional data. This line of research has important connections to panel data analysis where missing data is a challenging and practically relevant problem. Another project is centered around the very recent FDA literature that consider local-specific points within the functional data that have particular influence on the response variable.

Research Area H Dominik Liebl's research within Area H focuses on statistical problems in modeling complex high-dimensional data structures. Development of statistical theory goes hand in hand with practical implementations and empirical data analysis. In a first group of projects, he investigates the problem of inference in sparse functional data settings and applies the theoretical findings in order to test for differences in electricity prices before and after Germany's atom moratorium in March, 2011 (see [3] and [2]). The second projects deals with the functional linear regression model incorporating so-called points-of-impact. This research significantly improves the finite-sample performance of existing estimation procedures and allows for a big-data analysis of Google-AdWords campaigns (see [4]). The third research project deals with statistical theory on the optimal reconstruction of partially observed functions (see [1]). The Idiosyncratic volatility puzzle motivated a fourth research project (see [5]) which proposes a new panel data model allowing for different parameter regimes in order to reveal heterogeneity at asset markets.

Selected publications

[1] Alois Kneip and Dominik Liebl. On the optimal reconstruction of partially observed functional data. *Working Paper arXiv:1710.10099*, pages 1–53, 2017.

[2] Dominik Liebl. Finite sample correction for two-sample inference with sparse covariate adjusted functional data. *Working Paper arXiv:1711.03367 (Revise and Resubmit at the Annals of Applied Statistics)*, pages 1–27, 2017.

[3] Dominik Liebl. Inference for functional data with covariate adjustments: From sparse to dense and everything in-between. *Working Paper arXiv:1601.07780 (Revise and Resubmit at the Journal of Multivariate Statistics)*, pages 1–30, 2017.

[4] Dominik Liebl, Stefan Rameseder, and Christoph Rust. Functional insights into google adwords. *Working Paper arXiv:1709.02166*, pages 1–21, 2017.

[5] Dominik Liebl and Fabian Walders. Parameter regimes in partial functional panel regression. *Working Paper arXiv:1709.05786*, pages 1–51, 2017.

[6] Oualid Bada and Dominik Liebl. The r-package phtt: Panel data analysis with heterogeneous time trends. *arXiv preprint arXiv:1407.6484*, 2014.

[7] Gert-Peter Brüggemann, Joseph Hamill, Dominik Liebl, and Steffen Willwacher. Ankle plantarflexion strength in rearfoot and forefoot runners: A novel clusteranalytic approach. *Human movement science*, 35:104–120, 2014.

[8] Alois Kneip and Dominik Liebl. Modelling electricity prices as functional data on random domains. *Contributions in infinite-dimensional statistics and related topics*, page 173, 2014.

[9] Dominik Liebl. Modeling and forecasting electricity spot prices: a functional data perspective. *Ann. Appl. Stat.*, 7(3):1562–1592, 2013.