

# Jörg Stoye



## Academic career

1999	Diplom-Volkswirt, University of Cologne
2000	M.Sc., Economics and Philosophy (with Distinction), LSE, London, England, UK
2001	M.A., Economics, Northwestern University, Evanston, IL
2005	PhD, Economics, Northwestern University, Evanston, IL
2005 - 2010	Assistant Professor, New York University, NY, USA
2009	Visiting Research Fellow, Cowles Foundation, Yale University, New Haven, CT, USA
Since 2010	Associate Professor, Cornell University, Ithaca, NY, USA (on leave, July 2016 - present)
Since 2016	Professor, University of Bonn

## Research profile

In past research, Stoye explored connections between statistical decision theory and applied economic analysis, with special attention to treatment/policy choice problems and to minimax regret as optimality criterion. In axiomatic analyses, he provided normative foundations for minimax regret and related criteria [5, 8, 9]. Parallel work in econometrics undertook finite sample (non-approximate) analysis of econometric treatment choice problems, e.g. the use of covariates in treatment assignment [7, 11, 13]. Stoye also advanced the literature on partial (set valued) identifiability of parameters and on inference in such settings [10, 12]. More recently (with Stefan Hoderlein, Boston College), he proposed statistical tests of revealed preference analysis from microeconomic theory, asking whether the homo oeconomicus model is testable under otherwise weak assumptions on real-world data [4, 6].

Some of Stoye's current research extends this last project. With Yuichi Kitamura (Yale), he identifies the precise empirical content of Random Utility models in repeated cross-section data, assuming unrestricted unobservable heterogeneity among consumers and therefore an infinite dimensional nuisance parameter. Their statistical test overcomes both computational and theoretical (in the form of nonstandard asymptotic behavior) hurdles. It is extended to other, less standard economics models in work with Kitamura, Rahul Deb (Toronto), and John Quah (Johns Hopkins). The long-term vision is to fundamentally rethink the large economics literature on nonparametric demand, complementing its current "specific to general" approach (i.e., imposing an extremely tight structure and maybe gradually relaxing it) with a "general to specific" approach that initially tests whether data are consistent with minimal economic assumptions and, in future research, gradually relaxes the generality to obtain tighter conclusions. In other early stage research, Stoye (with Hiroaki Kaido, Boston University, and Francesca Molinari, Cornell) develops confidence sets for the optimal values of programs with estimated objective function as well as constraints. These sets will be valid uniformly over a large class of sampling processes and without so-called constraint qualifications. Notable applications are to policy counterfactuals in economic models as well as to projections of partially identified parameter vectors and are being explored empirically.

## Editorships

- Review of Economics and Statistics (since 2014)

**Research Area H** My recent focus has been on two issues: (i) What discipline do core economic assumptions, e.g. homo oeconomicus, directly impose on data that are realistically observed if one drops auxiliary assumptions of convenience? For example, in the empirically relevant

context of repeated cross-sectional data, this means to assume that all individuals in an underlying population are rational in the sense of maximizing some criterion function, but that the population distribution of criterion functions is unrestricted. This leads to nonparametric testing of extremely high dimensional models, though important dimension reductions turn out to be available in practice [4, 6, 3]. Extensions to less standard models of consumer behavior are in progress. (ii) How can we perform inference on low-dimensional functions of moderate to high dimensional parameters that are only partially statistically identified. Applications include separate inference on components of partially identified vectors but also value functions of optimization problems (e.g., maximization of social welfare in macroeconomic models) with estimated objective function and constraints. The inference problem is highly irregular due to the presence of nonidentifiable nuisance parameters. The solution involves powerful new regularization techniques as well as novel black-box optimization algorithms whose convergence is established [2, 1].

## Supervised theses

PhD theses: 1

## Selected publications

- [1] Hiroaki Kaido, Francesca Molinari, Jörg Stoye, and Matthew Thirkettle. Calibrated projection in matlab: Users' manual. *eprint arXiv:1710.09707*, 2017.
- [2] Hiroaki Kaido, Francesca Molinari, and Jörg Stoye. Confidence intervals for projections of partially identified parameters. *eprint arXiv:1601.00934 Revise and Resubmit at Econometrica*, 2016.
- [3] Yuichi Kitamura and Jörg Stoye. Nonparametric analysis of random utility models. *eprint arXiv:1606.04819 Revise and Resubmit at Econometrica*, 2016.
- [4] Stefan Hoderlein and Jörg Stoye. Testing stochastic rationality and predicting stochastic demand: the case of two goods. *Econ. Theory Bull.*, 3(2):313–328, 2015.
- [5] Jörg Stoye. Choice theory when agents can randomize. *J. Econom. Theory*, 155:131–151, 2015.
- [6] Stefan Hoderlein and Jörg Stoye. Revealed preferences in a heterogeneous population. *The Review of Economics and Statistics*, 96(2):197–213, 2014.
- [7] Jörg Stoye. Minimax regret treatment choice with covariates or with limited validity of experiments. *J. Econometrics*, 166(1):138–156, 2012.
- [8] Jörg Stoye. Axioms for minimax regret choice correspondences. *J. Econom. Theory*, 146(6):2226–2251, 2011.
- [9] Jörg Stoye. Statistical decisions under ambiguity. *Theory and Decision*, 70(2):129–148, 2011.
- [10] Jörg Stoye. Partial identification of spread parameters. *Quant. Econ.*, 1(2):323–357, 2010.
- [11] Jörg Stoye. Minimax regret treatment choice with finite samples. *J. Econometrics*, 151(1):70–81, 2009.
- [12] Jörg Stoye. More on confidence intervals for partially identified parameters. *Econometrica*, 77(4):1299–1315, 2009.
- [13] Jörg Stoye. Minimax regret treatment choice with incomplete data and many treatments. *Econometric Theory*, 23(1):190–199, 2007.