Liyu Dou

Princeton University

Placement Director: Steve Redding   reddings@princeton.edu   +1 (609) 258-4016
Graduate Administrator: Laura Hedden   lhedden@princeton.edu   +1 (609) 258-4006

Contact Information

Department of Economics
Princeton University
Julis Romo Rabinowitz Building
Princeton, NJ 08544

Phone: +1 (609) 647-7911
Email: ldou@princeton.edu
Homepage: https://sites.google.com/view/liyudou/

Education

Ph.D. Economics, Princeton University, 2013–present.

M.Sc. Econometrics and Mathematical Economics with Distinction, LSE, 2011–2012.

B.Sc. Mathematics and Economics, Nanyang Technological University, Singapore, 2007–2011.

References

Professor Ulrich Müller
Department of Economics
Princeton University
(609) 258-4520
umueller@princeton.edu

Professor Mark Watson
Department of Economics
Princeton University
(609) 258-4811
mwatson@princeton.edu

Professor Michal Kolesár
Department of Economics
Princeton University
(609) 258-6726
mkolesar@princeton.edu

Teaching and Research Fields

Primary Field   Econometrics
Secondary Fields   Industrial Organization, Applied Econometrics

Job Market Paper

Optimal HAR Inference.

Abstract: This paper considers the problem of deriving heteroskedasticity and autocorrelation robust (HAR) inference about a scalar parameter of interest. I derive finite-sample optimal tests in the Gaussian location model, under nonparametric assumptions on the underlying spectral density. The optimal test trades off bias and variability, and requires an adjustment of the critical value to account for the maximum bias of the implied long-run variance estimator. I find that with an appropriate adjustment to the critical value, it is nearly optimal to use the so-called equal-weighted cosine (EWC) test, where the long-run variance is estimated by projections onto q type II cosines. The practical implications are an explicit link between the choice of q and assumptions on the underlying spectrum, as well as a corresponding adjustment to the usual Student-t critical value. Simulations show that the suggested new EWC test also performs well outside the Gaussian location model.

Research Papers

Generalized Local-to-Unity Models. (Joint with Ulrich Müller)

Abstract: We introduce a generalization of the widely used local-to-unity model of time series persistence by allowing for p autoregressive roots and $p-1$ moving average roots to be close to unity. This generalized local-to-unity model (GLTU(p)) induces convergence of the suitably scaled time series to a continuous time Gaussian ARMA($p, p-1$) process on the unit interval. Our main theoretical result establishes the richness of this form of limiting processes, in the sense that they can well approximate a large class of stationary Gaussian processes in the total variation norm. We further show that Campbell and Yogo's (2006) popular inference method for predictive regressions fails to control size under the GLTU(2) model with empirically plausible parameter values, and we propose a limited information Bayesian framework for inference in the GLTU(p) model and apply it to quantify the uncertainty about the half-life of deviations from Purchasing Power Parity.

Quantifying Delay Externalities in Airline Networks. (Joint with Jakub Kastl and John Lazarev)

Abstract: We propose a model of aircraft scheduler who allocates effort to minimize costs of delay on a network. We further develop a framework for quantifying delay externalities in airline networks and show how the effort cost can be identified. Using a large comprehensive data set on actual delays and a model-selection algorithm (elastic net) we estimate a weighted directed graph of delay propagation for each major airline in the US. We then use these estimates to describe how network topology and other airline network characteristics (such as aircraft fleet heterogeneity) affect the expected delays. We also use the estimated effort cost to evaluate counterfactual scenarios of investments in airport infrastructure.

Trial and Error in Influential Social Networks. In *Proceedings of the 19th ACM SIGKDD Conference on Knowledge, Discovery, and Data Mining (KDD)*, ed. by Inderjit S. Dhillon et al., ACM (2013), 1016-1024. (Joint with Ning Chen, Xiaohui Bei, Xiangru Huang and Ruixin Qiang.)

Research Experience

July 2015–June 2016	Research Assistant for Professor Jakub Kastl
June 2014–July 2014	Research Assistant for Professor Ulrich Müller

Teaching Experience

Summer 2017, 2018	Preceptor for Professor Ezra Oberfield, Graduate Math Camp, Princeton University
Fall 2017	Preceptor for Professor Bo Honoré and Professor Michal Kolesár, Graduate Econometric Theory I, Princeton University
Fall 2015, 2016	Preceptor for Professor Bo Honoré and Professor Mark Watson, Graduate Econometric Theory I, Princeton University
Summer 2016	Preceptor for Professor Juan Pablo Xandri, Graduate Math Camp, Princeton University

Honors, Awards and Fellowships

2013–present	Princeton University Graduate Fellowship
2012	Ely Devons Prize, LSE
2012	Institute of New Economic Thinking Scholarship, Copenhagen
2011	Lee Kuan Yew Gold Medal, Nanyang Technological University, Singapore

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