SAMUEL HIGBEE

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Education

University of Chicago, Ph.D. Economics *2019–present*

Brigham Young University, B.S. Mathematics & Economics *2015–2019*

References

Professor Stéphane Bonhomme (Chair)
University of Chicago
Kenneth C. Griffin Department of Economics
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Professor Guillaume Pouliot
University of Chicago
Harris School of Public Policy
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Professor Max Tabord-Meehan
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Professor Arun Chandrasekhar
Stanford University
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Research and Teaching Fields

Primary: Econometrics
Secondary: Applied microeconomics

Job Market Paper

Experimental Design for Policy Choice

I study how to design experiments for the objective of choosing optimal polices. An experimenter wants to choose a policy to maximize welfare subject to budget or other policy constraints. The effects of counterfactual policies are described by a structural econometric model governed by an unknown parameter. The experimenter has access to some pilot data, and has the opportunity to collect additional data through an experiment. The joint experimental design and policy choice problem is a dynamic optimization problem with a very high-dimensional state space, since the chosen policy depends on the realized data. I propose a low-dimensional approximation to the solution and show it is asymptotically optimal under Bayes expected welfare. The method applies to policies allocating discrete as well as continuous treatments, such as cash transfers, prices, or tax credits, and also allows targeting the policy based on covariates. I demonstrate the method using the conditional cash transfer program Progresa, showing how to design an experiment to help choose a policy aimed at increasing graduation rates and reducing gender disparities in education. Compared to the original Progresa experiment, the optimal experiment requires only one quarter as many observations to obtain equally effective policies.

Working Papers

Policy Learning with New Treatments
Revision requested at Quantitative Economics

I study the problem of a decision maker choosing a policy to allocate treatment to a heterogeneous population on the basis of experimental data that includes only a subset of possible treatment values. The effects of new treatments are partially identified based on shape restrictions on treatment response. I propose solving an empirical minimax regret problem to estimate the policy and show it has a tractable linear- and integer-programming formulation. I prove the maximum regret of the estimator converges to the lowest possible maximum regret at the rate at which heterogeneous treatment effects can be estimated in the experimental data or $n^{-1/2}$, whichever is slower. I apply my results to design targeted subsidies for electrical grid connections in rural Kenya, and estimate that 97% of the population should be given a treatment not implemented in the experiment.

Work in Progress

Distributionally Robust Optimal Transport
with Omkar Katta & Guillaume Pouliot

Many partially identified parameters in program evaluation settings are instances of the general Fréchet problem of bounding a functional of a joint distribution when only its marginals are observed. A leading example is the distribution of treatment effects. Using data on covariates can tighten the identified set, but doing so nonparametrically is difficult in practice. We propose a distributionally robust optimal transport framework for inference on the solution to the Fréchet problem which nonparametrically incorporates covariate data and show it delivers valid inference on these parameters. We show our infinite-dimensional distributionally robust optimal transport problem has a finite-dimensional linear programming formulation, facilitating computation.

Conference Presentations

2024:	Econometrics Junior Conference (University of Notre Dame) Brigham Young University Graduate Student Conference (Provo, UT) ASSA Winter Meeting (San Antonio, TX)
2023:	Chicago Student Causal Inference Conference (University of Chicago) Economics Graduate Student Conference (Washington University in St. Louis) Optimization-Conscious Econometrics Conference (University of Chicago)
2022:	Delhi School of Economics Winter School (Delhi, India) Brigham Young University Graduate Student Conference (Provo, UT)

Awards, Scholarships, and Grants

Rosen Memorial Fellowship	*2024-2025*
Roswell & Mary McKeon Whitman Scholarship	*2024-2025*
Martin & Margaret Lee Prize (high score on microeconomics core exam)	*2020*
University of Chicago Social Sciences Division Fellowship	*2019–2024*
Thomas S. Monson Presidential Scholarship	*2015–2019*

Teaching Experience

Optimization-Conscious Econometrics (PhD) *Spring 2023*
TA for Prof. Guillaume Pouliot

Econometrics (undergraduate) *Winter 2023, Spring 2022*
TA for Prof. Max Tabord-Meehan

Topics on the Analysis of Randomized Experiments (PhD) *Winter 2022*
TA for Prof. Max Tabord-Meehan

Applied Regression Analysis (MBA) *Fall 2021*
TA for Prof. Max Farrell

Empirical Analysis III (PhD) *Spring 2021*
TA for Prof. James Heckman

Service

Organizer of Semiparametrics Reading Group, University of Chicago *2023*

Research Experience and Other Employment

Research Assistant for Prof. Lars Lefgren, Brigham Young University *2017–2019*

Consulting Research Assistant, LSAC *2018–2019*

Additional Information

Citizenship USA

Programming Skills Julia, R, Python, Git

Languages English (Native)