MIT Economics

BEN DEANER

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DOCTORAL STUDIES

Massachusetts Institute of Technology (MIT)
PhD, Economics and Statistics, Expected completion June 2021
DISSERTATION: "Essays in Econometrics: Nonparametrics and Robustness"

DISSERTATION COMMITTEE AND REFERENCES

Professor Whitney Newey
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Jerry Hausman
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PRIOR EDUCATION

Oxford University — 2015
MPhil, Economics
Distinction

Oxford University — 2013
B.A, Philosophy, Politics, and Economics
First Class

CITIZENSHIP United Kingdom **GENDER** Male

FIELDS

Primary Fields: Econometrics

Secondary Fields: Applied Microeconomics, Industrial Organization

TEACHING EXPERIENCE

Intro to Statistical Methods in Economics (undergraduate, MIT course 14.30), Teaching Assistant to Professors Whitney Newey and Alberto Abadie	2020
New Econometric Methods (graduate, MIT course 14.386), Teaching Assistant to Professors Kirill Evdokimov and Alberto Abadie	2019
Research & Communications in Economics (undergraduate, MIT course 14.33), Teaching Assistant to Professor Simon Jäger	2019
Nonlinear Econometric Methods (graduate, MIT course 14.385), Teaching Assistant to Professors Whitney Newey and Alberto Abadie	2017
Intro to Statistical Methods in Economics (undergraduate, MIT course 14.30), Teaching Assistant to Professor Whitney Newey and Alberto Abadie	2017

RELEVANT POSITIONS

Research Assistant to Professors Whitney Newey and Jerry Hausman	2016-20
Research Assistant to Professor Anna Mikusheva	2020
Research Assistant to Professor Isaiah Andrews	2018
Research Assistant to Professor David Atkin	2017

FELLOWSHIPS, HONORS, AND AWARDS

Hausman Dissertation Fellow	2018
John Krob Castle 1963 Fellow	2016
George Webb Medley Graduate Prize	2014
ESRC 2+2 Award	2013

PROFESSIONAL ACTIVITIES

Presentations:

Econometric Society World Congress, Bocconi University	2020
AEA/ASSA annual meeting, San Diego	2020
Econometric Society European Summer Meeting, The University of Manchester	2019
Econometric Society North American Summer Meeting, The University of Washington	2019

RESEARCH PAPERS

"Proxy Controls and Panel Data" (Job Market Paper)

We present a flexible approach to identification and estimation of causal objects in nonparametric, non-separable models using `proxy controls': covariates that do not satisfy a standard `unconfoundedness' assumption but are informative proxies for variables that do. Our analysis applies to cross-sectional settings but is particularly well-suited to panel models. Our identification results motivate a simple and `well-posed' nonparametric estimator. We derive convergence rates for the estimator and construct uniform confidence bands with asymptotically

correct size. In panel settings, our methods provide a novel approach to the difficult problem of identification with non-separable general heterogeneity and fixed T. In panels, observations from different periods serve as proxies for unobserved heterogeneity and our key identifying assumptions follow from restrictions on the serial dependence structure. We apply our methodology to two empirical settings. We estimate causal effects of grade retention on cognitive performance using cross-sectional variation and we estimate consumer demand counterfactuals using panel data.

"**Nonparametric Instrumental Variables Estimation Under Misspecification**" **(Revise & Resubmit Econometrica)**

We show that nonparametric instrumental variables (NPIV) estimators are highly sensitive to misspecification: an arbitrarily small deviation from instrumental validity can lead to large asymptotic bias for a broad class of estimators. One can mitigate the problem by placing strong restrictions on the structural function in estimation. However, if the true function does not obey the restrictions then imposing them imparts bias. Therefore, there is a trade-off between the sensitivity to invalid instruments and bias from imposing excessive restrictions. In light of this trade-off we propose a partial identification approach to estimation in NPIV models. We provide a point estimator that minimizes the worst-case asymptotic bias and error-bounds that explicitly account for some degree of misspecification. We apply our methods to the empirical setting of Blundell et al. (2007) and Horowitz (2011) to estimate shape-invariant Engel curves.

"Approximation-Robust Inference in Dynamic Discrete Choice"

Estimation and inference in dynamic discrete choice models often relies on approximation to lower the computational burden of dynamic programming. Unfortunately, the use of approximation can impart substantial bias in estimation and results in invalid confidence sets. We present a method for set estimation and inference that explicitly accounts for the use of approximation and is thus valid regardless of the approximation error. We show how one can account for the error from approximation at low computational cost. Our methodology allows researchers to assess the estimation error due to the use of approximation and thus more effectively manage the trade-off between bias and computational expedience. We provide simulation evidence to demonstrate the practicality of our approach.

RESEARCH IN PROGRESS

"Ridge Estimation of Panel Average Effects" (With Whitney Newey, Jerry Hausman, and Ying Gao)

We present and analyze a ridge-regularized estimator of the average structural parameters in a linear panel model with general heterogeneity. Price coefficients may differ both between individuals and across time, and may be correlated with the regressors as long as income effects are time-stationary. We allow for a combination of multiple discrete and continuous regressors. We also describe a debiased version of our estimator that corrects for the regularization bias imposed

by applying ridge at the level of the individual. We present asymptotic analysis of the estimator under a growing number of individuals and time periods. This approach, used in "Demand Analysis with Many Prices", provides a promising method for estimating average coefficients, including panel average treatment effects, in other settings with many regressors.

"Identification, Estimability, and Unbiasedness in Panel Models"

Identification and estimation in panel models with a fixed time dimension T is a topic that has received considerable attention. Much work on this topic aims to develop sufficient conditions under which population parameters are identified and consistently estimable at some rate. We explore the converse question: what conditions are necessary for identification and consistent estimability? In particular, we consider parameters of the form $E[\mu_i]$, where μ_i is some individual-specific parameter (specific to individual i). It is well-known that the existence of an unbiased estimator of μ_i that can be evaluated with fewer than T observations is sufficient for identification of $E[\mu_i]$ and existence of a consistent estimator. We consider conditions on the parameter space under which a converse holds: existence of an unbiased estimator or existence of an estimator with arbitrarily small bias is necessary for identification and consistent estimation. Results of this kind provide a path towards developing non-identification results which apply for a range of models. In addition, these results aid in the development of positive identification results because they clarify when it is enough to look for unbiased estimators of the individual-specific parameters.