BEN DEANER

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CURRENT POSITION

Yale University, Cowles Foundation, Department of Economics
Postdoctoral Associate

POSTDOCTORAL PROGRAM COORDINATOR

Darlene Smith
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DOCTORAL STUDIES

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

DISSERTATION COMMITTEE AND REFERENCES

Professor Whitney Newey
MIT Department of Economics
77 Massachusetts Avenue, **E52-424**
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Anna Mikusheva
MIT Department of Economics
77 Massachusetts Avenue, **E52-526**
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Jerry Hausman
MIT Department of Economics
77 Massachusetts Avenue, **E52-518**
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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

Recent Developments in Causal Inference (graduate, Yale ECON 573) Sole instructor and designer of the course.	2021
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	2019

	of Manchester	
	Econometric Society North American Summer Meeting, The University of Washington	2019

RESEARCH PAPERS

"Proxy Controls and Panel Data" (Job Market Paper, Revise & Resubmit Review of Economic Studies)

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**"

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 that one can

account for the error from approximation at low computational cost. We provide simulation evidence that our approach can lead to set estimates and robust confidence sets that are not too large and demonstrate how our methodology allows researchers to more effectively manage the trade-off between bias and computational expedience.

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 - 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.

"Many Linear Proxy Controls"

A recent literature considers causal inference using noisy proxies for unobserved confounding factors. The proxies are divided into two sets that are independent conditional on the confounders. One set of proxies are `negative control treatments' and the other are `negative control outcomes'. Existing work applies to low-dimensional settings with a fixed number of proxies and confounders. In this work we consider linear models with proxy controls and develop methods that are suitable for high-dimensional applications, i.e., settings with many proxies and possibly many confounding factors. A key insight is that if each group of proxies is larger than the number of confounding factors then a matrix of nuisance parameters has a low-rank structure. We can exploit the low-rank structure in estimation to reduce the number of free parameters. The number of unobserved confounders is usually not known a priori but we show that it is identified and we apply ideas from the literature on reduced-rank regression in order to adapt to this quantity. We provide simulation evidence that our methods achieve better performance than existing approaches, particularly in high-dimensional settings.

"Instrumental Variables Methods for Matrix Completion" (With Anish Agarwal and Rahul Singh)