MIT Economics

SYLVIA KLOSIN

OFFICE CONTACT INFORMATION
MIT Department of Economics
77 Massachusetts Avenue, E52-301
Cambridge, MA 02139
klosins@mit.edu
https://economics.mit.edu/people/phd-students/sylvia-klosin

HOME CONTACT INFORMATION
31 Buena Vista Park, Apt 1
Cambridge, MA 02140
Mobile: 989-941-9992

MIT PLACEMENT OFFICER
Professor David Autor
dautor@mit.edu
617-253-4669

MIT PLACEMENT ADMINISTRATOR
Ms. Shannon May
shmay@mit.edu
617-324-5857

DOCTORAL STUDIES

Massachusetts Institute of Technology (MIT)
PhD, Economics and Statistics, Expected Completion June 2025
DISSERTATION: "Essays in Econometrics"

DISSERTATION COMMITTEE AND REFERENCES

Whitney Newey
MIT Department of Economics
77 Massachusetts Avenue, E52-520
Cambridge, MA 02139
617-253-6420
wnewey@mit.edu

Victor Chernozhukov
MIT Department of Economics
77 Massachusetts Avenue, E52-524
Cambridge, MA 02139
617-253-4767
vchern@mit.edu

Benjamin Olken
MIT Department of Economics
77 Massachusetts Avenue, E52-542
Cambridge, MA 02139
617-324-5085
bolken@mit.edu

Isaiah Andrews
MIT Department of Economics
77 Massachusetts Avenue, E52-530
Cambridge, MA 02139
617-253-4860
iandrews@mit.edu

PRIOR EDUCATION

University of Chicago 2017
B.A., Economics (with Honors) and B.A., Statistics

CITIZENSHIP USA **GENDER:** Female

LANGUAGES English (native), Polish (fluent)

FIELDS Primary Fields: Econometrics and Environmental Economics

TEACHING EXPERIENCE

Environmental Economics (graduate, MIT course 14.475) 2025
Teaching Assistant to Professors Jacob Moscona and Ben Olken (upcoming Spring 2025)
Time Series Analysis (graduate, MIT course 14.384)
Teaching Assistant to Professor Anna Mikusheva 2021, 24

Statistical Methods in Economics (graduate, MIT course 14.380) 2021
Teaching Assistant to Professor Anna Mikusheva
Applied Econometrics (graduate, MIT course 14.381) 2021
Teaching Assistant to Professor Whitney Newey

RELEVANT POSITIONS

Research Fellows Program, The Stanford Graduate School of Business. Professors Susan Athey and Guido Imbens 2019
Summer Research Intern, The Federal Reserve Bank of New York. Drs. Rajashri Chakrabarti and Wilbert van der Klaauw 2016
White House Summer Research Intern, The Council of Economic Advisors. Professors Abigail Wozniak and Betsy Stevenson 2015

FELLOWSHIPS, HONORS, AND AWARDS

George and Obie Shultz Fund Grant 2022
MIT Economics Best Graduate TA of the Year 2022
Jerry A. Hausman Graduate Dissertation Fellowship 2022
NSF Graduate Research Fellowship 2019
David S. Hu Award (University of Chicago) 2017
Becker-Friedman Institute Award for Outstanding Undergraduate Service (University of Chicago) 2017

PROFESSIONAL ACTIVITIES

Referee: The Econometrics Journal, Journal of the Association of Environmental and Resource Economists

Presentations:

Harvard Climate Economics Pipeline Workshop, Harvard Kennedy School 2023
Africa Meeting of the Econometric Society (Invited Session: Climate Econometrics), The African Economic Research Consortium 2023
Machine Learning in Economics Summer Institute, University of Chicago Economics 2022
Rising Scholars Conference, University of Chicago Booth 2022
International Econometrics PhD Conference, Erasmus School of Economics 2022

RESEARCH PAPERS

Dynamic Biases of Static Panel Data Estimators (Job Market Paper)

This paper identifies an important bias — termed dynamic bias — in fixed effects panel estimators that arises when dynamic feedback is ignored in the estimating equation. Dynamic feedback occurs if past outcomes impact current outcomes, a feature of many settings ranging from economic growth to agricultural and labor markets. When estimating equations omit past outcomes, dynamic bias can lead to significantly inaccurate treatment effect estimates, even with randomly assigned treatments. This dynamic bias in simulations is larger than Nickell bias. I show that dynamic bias stems from the estimation of

fixed effects, as their estimation generates confounding in the data. To recover consistent treatment effects, I present a flexible estimator that provides fixed-T bias correction. I apply this approach to study the impact of temperature shocks on GDP, a canonical example where economic theory points to an important feedback from past to future outcomes. Accounting for dynamic bias lowers the estimated effects of higher yearly temperatures on GDP growth by 10% and GDP levels by 120%.

Estimating Continuous Treatment Effects In Panel Data using Machine Learning with a Climate Application (with Max Vilgalys)

Climate economists often use a two-way fixed effect linear panel data model to estimate the treatment effect of a continuous variable like temperature. However, this approach yields biased estimates if the linear parametric model is misspecified. This paper introduces a high-dimensional machine learning-based estimator for continuous treatment effects, extending the double de-biased machine learning literature to panel settings with fixed effects. We prove our estimator is asymptotically normal. Our estimator leads to significantly larger (by 50%), but just as precise, estimates of the effect of extreme heat on corn yield in comparison to the literature's linear models.

Optimal Insurance Scope: Theory and Evidence from US Crop Insurance (with Adam Solomon)

Distinct risks are typically insured separately. A single `aggregate' contract that pays more when many shocks occur simultaneously, but less when positive shocks offset negative shocks, is utility-increasing absent moral hazard. However, an aggregate contract discourages diversification, leading to a novel insurance-incentive trade-off. We study the US Federal Crop Insurance Program (FCIP), where farmers can choose the `scope' of their policy - whether to insure each field separately, or all fields of the crop as an aggregate unit. Starting in 2009, the FCIP introduced a large subsidy increase for aggregate insurance. We show that farms that moved to aggregate insurance reduced crop diversity and irrigation, farmed less and conserved more land, and insured price risk --- all reducing the diversification of their risks. This increased the variability of farm yield by 14%, raising the fiscal cost of aggregate insurance by about $1.5 billion per year. We find that an aggregate policy is never welfare maximizing, but that the optimal policy lies partway between separate and aggregate.

Bagged Polynomial Regression and Neural Networks (with Jaume Vives)

Series and polynomial regression can approximate the same function classes as neural networks. However, these methods are rarely used in practice, although they offer more interpretability than neural networks. In this paper, we show that a potential reason for this is the slow convergence rate of polynomial regression estimators and propose the use of bagged polynomial

regression (BPR) as an attractive alternative to neural networks. Theoretically, we derive new finite sample and asymptotic L2 convergence rates for series estimators. We demonstrate that BPR performs as well as neural networks in crop classification using satellite data, a setting where prediction accuracy is critical, and interpretability is often required for addressing research questions.

Automatic Double Machine Learning for Continuous Treatment Effects

In this paper, I introduce and prove the asymptotic normality of a novel nonparametric estimator for continuous treatment effects. Continuous variables, such as environmental factors like temperature and pollution levels, are frequently studied in economics and often require flexible modeling approaches. I estimate points on the average dose-response function, which captures the expected outcome at a specific level of the treatment variable. My approach integrates advanced techniques from double debiased machine learning (DML) and automatic double machine learning (ADML) to construct the estimator. A novel debiasing method enhances the theoretical stability and balancing properties of the estimator. Simulations demonstrate that my estimator outperforms existing methods.

Synthetic Differences and Differences with Covariates (with David Hirshberg)

We propose a synthetic difference-in-difference estimator that incorporates time-varying covariates (SDIDC). We incorporate covariates into a high-dimensional least squares with correlated error-in-variables setting. We use results from this setting to derive conditions under which our synthetic differences-in-differences estimator is asymptotically normal with estimable variance. Monte Carlo simulations demonstrate that our estimator outperforms classic synthetic difference-in-differences in settings where covariates contain information about the outcome. We illustrate the practical performance of our estimator by studying the impact of subsidy increases on crop insurance choices. Treatment effects using SDIDC are 72% larger than commonly used two-way fixed effects models that incorporate covariates.

The Long-Term Effect of Childhood Exposure to Technology Using Surrogates (with Nicolaj Søndergaard Mühlbach)

We study how childhood exposure to technology at ages 5-15 via the occupation of the parents affects the ability to climb the social ladder in terms of income at ages 45-49 using the Danish micro data from years 1961-2019. The challenge in estimating this effect is that long-term outcome is observed over a different time horizon than our treatment of interest. We therefore adapt the surrogate index methodology, linking the effect of our childhood treatment on intermediate surrogates, such as income and education at ages 25-29, to the effect on adulthood income. We estimate that a one standard

error increase in exposure to technology increases the income rank by 2%-points, which is economically and statistically significant and robust to cluster-correlation within families. The derived policy recommendation is to update the educational curriculum to expose children to computers to a higher degree, which may then act as a social leveler.