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M.I.T. Placement Administrator
Ms. Shannon May
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(617) 324-5857

Doctoral Studies
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2022
Dissertation: “Essays on the Economics of Place-Based Housing Policies”

Dissertation Committee and References

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Professor Rebecca Diamond
Stanford Graduate School of Business
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Stanford, CA 94305
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diamondr@stanford.edu

Prior Education
Barcelona Graduate School of Economics, Spain
MSc in Economics
2016
Pompeu Fabra University, Spain
Bachelor in Economics
2015

Citizenship
Spain
Gender: Male

Languages
English (fluent), Spanish (native), Catalan (native), French (intermediate)

Fields
Primary Fields: Public Economics
Secondary Fields: Urban Economics, Industrial Organization
TEACHING EXPERIENCE

14.01 Introduction to Microeconomics, MIT (undergrad)  
TA to Professor Sara Ellison  2020
TA to Professor Jon Gruber  2018

14.73 The Challenge of World Poverty, MIT (undergrad)  
TA to Profs. David Atkin, Esther Duflo and Frank Schilbach  2019

Advanced Macroeconomics II, Pompeu Fabra U. (undergrad)  
TA to Professor Jordi Galí  2016

International Economics I, Pompeu Fabra U. (undergrad)  
TA to Professor Alessandra Bonfiglioli  2016

RELEVANT POSITIONS

Research Assistant to Professor Michael Whinston, MIT-NBER  2018-2019
Research Assistant to Professor Robert Townsend, MIT-NBER  2017-2018

FELLOWSHIPS, HONORS, AND AWARDS

Jerry A. Hausman Dissertation Fellowship, MIT  2020-2021
George and Obie Shultz Fund, Research grant, MIT  2019-2021
MIT Fellowship  2016-2018
La Caixa Foundation Graduate Fellowship  2016-2018
Catalunya-La Pedrera Foundation Graduate Fellowship  2015
Collaboration Fellowship, Spanish Ministry of Education  2013

PROFESSIONAL ACTIVITIES


Organizer for: Public Finance Lunch  2019-2020

Presentations:
Urban Economics Association, 15th North America Meeting  2021
Urban Economics Association, PhD Workshop -elevator pitch  2021

RESEARCH PAPERS

“Knocking it Down and Mixing it Up: The Impact of Public Housing Regenerations” (Job Market Paper)  
(with Lorenzo Neri)

This paper studies the effects of regenerating public housing into mixed-income communities on the local housing market. We exploit a wave of public housing regenerations in London that not only demolish and rebuild existing public housing but also almost double the number of units on-site with new market-rate units. Over a six-year period, we estimate that regenerations significantly raise nearby house prices and rents, although house prices decrease slightly farther away. We also find that they attracted higher-income households, increased positive amenities (e.g., cafés, restaurants), and reduced negative amenities (e.g., crime). The results are consistent with strong demand effects concentrated near the buildings and moderate effects from increased supply that persist in the broader area. We provide suggestive evidence that changes in the income mix of a neighborhood are important to explain price effects: regenerations in low-income areas and those adding a large number of market-rate units lead to larger price increases. Overall, the findings indicate that mixed-income housing can revitalize neighborhoods near decaying public housing, but that the supply of new market-rate units can also increase unaffordability in low-income neighborhoods.
“Pecuniary Effects of Public Housing Demolitions: Evidence from Chicago”  
*Revise and Resubmit, Journal of Urban Economics*

This paper studies the effects of public housing on private house prices. I examine the impact of a large and negative housing supply shock caused by the demolition of public housing developments in Chicago in the 1990s and 2000s. Using a synthetic control method based on census tracts in distant parts of the city, I estimate that house prices increased by about 20 percent over a ten-year period in census tracts near the demolitions. A calibration exercise suggests that the upward price pressure associated with reduced housing supply cannot fully explain the observed price effect. This leaves room for a contribution from positive amenities generated by demolitions, which raised the demand for nearby housing units. The estimated importance of amenity effects is, however, sensitive to the way the affected housing market is defined. The results highlight that, while public housing can lead to lower local house prices for unsubsidized households by increasing overall supply, the way in which the public sector supplies housing can impose significant adverse consequences on its neighbors.

“Redistribution through Housing Assistance”  
(with Juliette Fournier)

We examine the distributional implications of the shift from public housing to subsidized private housing initiated by the U.S. government over the past few decades. We build a quantitative urban framework where housing assistance complements income taxation to redistribute across workers. We argue that provision of affordable housing involves a trade-off between indirect pecuniary redistribution and direct amenity spin-offs. On the one hand, public housing drives local rents down, while amplifying the spatial concentration of poverty. On the other hand, project- and tenant-based rental assistance enhances the local amenities of subsidized households by promoting mixed-income communities but pushes private landowners’ rents up.

RESEARCH IN PROGRESS

“The Impact of Fair Share Housing Policies on Health and Opportunity: Evidence from Massachusetts' Chapter 40B”  
(with Noémie Sportiche, David Cutler, Madeleine Daep, and Erin Graves)

In the United States, access to opportunity and health are severely unequal across geographic and racial lines. One potential way to remedy these disparities is through policies that enable people to move from low-opportunity areas to high-opportunity, health-promoting areas. Massachusetts Chapter 40B is a supply-side housing policy that seeks to foster such moves by incentivizing the construction of affordable housing in high-opportunity areas —in part by allowing developers to bypass local zoning rules—and by recruiting potential beneficiaries from lower opportunity areas. In this paper, we examine the impact of moving low- and moderate-income households to affordable units in 40B developments on health outcomes and disparities in those outcomes. We identify the causal effect of 40B using exogenous variation from lotteries on oversubscribed affordable 40B units. To accomplish this, we are assembling a novel dataset of 40B lottery identifiers and 40B development addresses that will be linked to Infutor data, which contains the history of living addresses of individuals in Massachusetts, case-mix data on inpatient hospitalizations, and inpatient and outpatient health claims data from the Massachusetts All-Payer Claims Database. This work is funded by the Robert Wood Johnson Foundation.
“The Impact of New Mixed-Income Housing on NIMBYism: Housing Values, Migration, and Political Participation”
(with Noémie Sportiche)

This paper studies the responses of local residents to new mixed-income housing construction. We focus on Massachusetts’ Chapter 40B, a policy which increases mixed-income housing supply by requiring that all municipalities maintain at least ten percent of their housing stock as affordable. If a municipality opposes new development and does not meet this threshold, 40B allows private developers to override local zoning rules if they build a development where at least 20 to 25 percent of the units are affordable. This ability to override local zoning rules makes 40B highly controversial in affected communities and has led to well-documented NIMBYism responses. This paper aims to answer two questions based on common objections raised in response to new housing construction. First, what is the impact of 40B developments on local housing values? Second, how do local residents respond in terms of outmigration and political participation? To explore these issues, we construct a unique dataset by linking data from several sources including a novel dataset of validated 40B development addresses, the history of living addresses of individuals in Massachusetts, a novel dataset on local political participation, broader voter registration histories, and real estate transactions data.

“Price Responses to Affordable Housing under Mandatory Inclusionary Zoning”
(with Lorenzo Neri)

Many housing assistance programs incentivize policies that involve a combination of affordable and market-rate units in the same building, i.e., mixed-income housing. Although prior research suggests that households in the private market are willing to pay to live in areas with higher-income neighbors, little is known about the magnitude of these preferences within a given building. This paper estimates the price response of market-rate units in mixed-income buildings to the share of affordable housing. We exploit variation from London’s mandatory inclusionary zoning program, under which new residential buildings are required to maintain a minimum amount of affordable housing set by each of the 33 city boroughs and that can vary on a case-by-case basis. Using an instrumental variables approach that leverages the discretionary part of the decision process, our preliminary results suggest that an increase in affordable housing in a mixed-income building significantly decreases the sale and rental prices of market-rate units in the same building.
**ARI BRONSOLE**

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**DOCTORAL STUDIES**
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2022

**DISSERTATION**
“Essays on Healthcare Delivery Innovations”

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- **Professor John Van Reenen**
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- **Professor Abhijit Banerjee**
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  617-324-5085
  banerjee@mit.edu

**PRIOR EDUCATION**
- Instituto Tecnológico Autónomo de México (ITAM), Mexico
  M.A in Economic Theory, highest honors
  2017

- Instituto Tecnológico Autónomo de México (ITAM), Mexico
  B.A in Applied Mathematics, highest honors
  2017

- Instituto Tecnológico Autónomo de México (ITAM), Mexico
  B.A in Economics, highest honors
  2015

**CITIZENSHIP**
Mexico

**GENDER**
Male

**LANGUAGES**
English (fluent), Spanish (native)

**FIELDS**
Primary Fields: Health Economics, Development Economics
Secondary Fields: Public Economics, Organizational Economics

TEACHING EXPERIENCE

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<td>14.310x: Data Analysis for social Scientists (EdX online)</td>
<td>2020</td>
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<td>Teaching Assistant to Profs. Esther Duflo and Sarah Ellison</td>
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<tr>
<td>14.75 Political Economy and Economic Development (undergraduate and DEDP master students)</td>
<td>2020</td>
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<td>Teaching Assistant to Profs. Abhijit Banerjee and Benjamin Olken</td>
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<tr>
<td>14.903 Strategy and Organization (MBA)</td>
<td>2019</td>
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<td>Teaching Assistant to Prof. Robert Gibbons</td>
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<tr>
<td>14.282 Organizational Economics (graduate)</td>
<td>2019</td>
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<tr>
<td>14.740x Foundations of Development Policy (EdX online)</td>
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RELEVANT POSITIONS

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<tr>
<td>Research Assistant to Profs. Joseph Doyle and John Van Reenen</td>
<td>2019-2022</td>
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<tr>
<td>Research Assistant to Prof. Kensuke Teshima</td>
<td>2016-2017</td>
</tr>
<tr>
<td>Research Assistant to Prof. Enrique Seira</td>
<td>2016-2017</td>
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<tr>
<td>Research Assistant to Prof. Nicolas Melissas</td>
<td>2015-2017</td>
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<tr>
<td>Health Economist at PEMEX-Mexican state-owned oil company</td>
<td>2016-2017</td>
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<tr>
<td>Project Coordinator at IMSS-largest public healthcare provider in Mexico</td>
<td>2014-2016</td>
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FELLOWSHIPS, HONORS, AND AWARDS

<table>
<thead>
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<td>Eli Lilly Global Health Initiative</td>
<td>2018</td>
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<td>Ex-ITAM best thesis award</td>
<td>2017</td>
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<td>FUNSALUD 30th anniversary best public health research</td>
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PROFESSIONAL ACTIVITIES

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<tr>
<td>Referee for Journal of Public Economics</td>
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<td>Organizer of AILatin American Summit</td>
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<td>Policy Advising for the Government of Yucatán</td>
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INVITED PRESENTATIONS

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<td>Interamerican Development Bank</td>
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OTHER ACTIVITIES

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<tr>
<td>Graduate Economic Association Social Chair</td>
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<td>Graduate Housing Committee at MIT</td>
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<tr>
<td>Eastgate Graduate Dorm. Events Coordinator</td>
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</table>
“Texting to Save Lives: Evidence from a Reform in Cardiovascular Treatment”  
(Job Market Paper)

Can widespread technology be leveraged to reduce healthcare fragmentation in a  
cost-effective way? This paper evaluates a program implemented by the largest  
public healthcare provider in Mexico (IMSS) that aims to reduce heart attack  
mortality by minimizing time to treatment for patients. The program has 2 main  
components which improve within hospital capabilities and increases across hospital  
transfer coordination through a group chat. I first document a large effect of the  
program among hospitals that have a higher survival gap relative to the specialized  
centers they can send patients to: survival rates increase by 29% (11pp) and  
transfers by 85% (5pp). I then present a model that disentangles the capabilities and  
communication channels and allows me to link the reduced form results to structural  
parameters. Counterfactual policy analysis shows that the chat groups are  
responsible for 67% of the survival effect and that, without the improvements in  
capabilities, transfers would be 4 times what is observed.

“Can Privatized Health Care Add Value? The Mexico Diabetes Experiment”  
(With Jonathan Gruber and Enrique Seira)

We implement a novel deniers randomization evaluation of a private supplement to  
the free public health system for one of the world’s deadliest health problems,  
diabetes. We estimate enormous impacts of the private supplement, increasing the  
share of those treated who are under control by 69%. This effect arises through both  
improved treatment compliance and health behaviors. Diabetes complications fall in  
the short run. The net costs of this intervention are at most one-third of the gross  
costs, and the returns to private care do not appear to reflect more productive delivery but rather more attachment to medical care.

“The impact of Healthcare IT on Clinical Quality, Productivity and Workers”  
(With Joseph Doyle and John Van Reenen)

Adoption of health information and communication technologies (“HICT”) has  
surged over the past two decades. We survey the medical and economic literature on  
HICT adoption and its impact on clinical outcomes, productivity, and labor. We find  
that HICT improves clinical outcomes and lowers healthcare costs, but (i) the effects  
are modest so far, (ii) it takes time for these effects to materialize, and (iii) there is  
much variation in the impact. More evidence on the causal effects of HICT on  
productivity is needed to guide further adoption. There is little econometric work  
directly investigating the impact of HICT on labor, but what there is suggests no  
substantial negative effects on employment and earnings. Overall, while healthcare  
is “exceptional” in many ways, we are struck by the similarities to the wider findings  
on ICT and productivity stressing the importance of complementary factors (e.g.  
management and skills) in determining HICT impacts.
“Why Patients Abandon Treatment?”
(With Jonathan Gruber and Enrique Seira)

A large share of patients with chronic diseases abandon treatment. Although there is a strong presumption that this hurts their health, causal evidence is lacking. We are conducting an RCT with 3,000 diabetic patients enrolled to a private one-stop shop clinic for diabetes to understand treatment attrition and its consequences. In particular, we first offer incentives to continue enrollment in order to estimate the causal effect of staying in treatment, knowledge of diabetes, expectations of treatment effectiveness, and estimated cost of complying with treatment. Second, we randomize the incentives to see whether it is more cost effective to incentivize clients to stay ex-ante, or to bring the abandoners back through a subsidy. The latter may be better targeted, but the former may encourage patients from the beginning to continue their treatment, therefore improving outcomes and retention. Third, we cross-randomize with a personalized information intervention to investigate whether it increases their knowledge and causes them to stay longer in treatment.

“Effect of Information Technology on the Healthcare Workforce”
(With Joseph Doyle and John Van Reenen)

The literature on health information technology adoption highlights overall positive but small effects on productivity, with vast heterogeneity in effects. However, very little is known about the effect of healthcare IT on the workforce empirically. Understanding the effects of health-IT on the health workforce is paramount as the U.S has dramatically increased its health-IT adoption rates over the past decade from under 20% in 2007 to 90% by 2015). In this project, we explore the relationship between health IT adoption and the healthcare workforce causally by exploiting a novel law adoption dataset that captures 19 legal dimensions related to health IT at the state level, yearly, from 2000 to 2020. We analyze the effects of adoption at the local labor market level, which enables us to track substitution patterns and overall effects at the industry level.

“Risk-Profiling of Potential Diabetics at IMSS: A Logistic Regression Approach”
(With Christian Norton, Oscar Sanchez, Kevin Schmidt, Carlos Tendilla)

Modern public medicine is increasingly relying on preventive rather than corrective action. This is happening because preventive care is proving cost-effective and desirable, as it can reduce length of convalescence and treatment expenditures while allowing for better living conditions for patients and improving longevity. In this document we describe the methodological steps by which we are able to estimate the risk of being diagnosed with Type 2 Diabetes Mellitus on individuals that attended a medical clinic from Mexico’s Institute for Social Security (IMSS) between 2012 and 2014. The results of this investigation lead to practical conclusions that show, for instance, that by applying our risk-profiling criteria for confirmatory laboratory test referral and without performing any additional medical tests, fifty-thousand additional diabetes cases would have been detected, which means a 90% increase in diagnosis. Highlighting the public-policy relevance of these conclusions, and
leveraging the structure of IMSS databases, we introduce a simple questionnaire that would allow risk-profiling to be applied to the population at large.
DOCTORAL STUDIES
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TEACHING EXPERIENCE

Microeconomic Theory III (graduate, MIT course 14.123) 2021
  Teaching Assistant to Professor Drew Fudenberg

Economic Applications of Game Theory (undergraduate, MIT course 14.12) 2020
  Teaching Assistant to Professor Muhamet Yildiz

Microeconomic Theory III (graduate, MIT course 14.123) 2020
  Teaching Assistant to Professor Drew Fudenberg

Game Theory (graduate, MIT course 14.126) 2020
  Teaching Assistant to Professors Drew Fudenberg and Muhamet Yildiz

Microeconomic Theory III (graduate, MIT course 14.123) 2019
  Teaching Assistant to Professor Drew Fudenberg

Game Theory (graduate, MIT course 14.126) 2019
  Teaching Assistant to Professors Drew Fudenberg and Muhamet Yildiz

RELEVANT POSITIONS

Research Assistant to Professor Drew Fudenberg 2017-21

Research Assistant to Professor Alexander Wolitzky 2019-20

Research Assistant to Professor Robert Gibbons 2018

FELLOWSHIPS, HONORS, AND AWARDS

MIT Economics Department Best Teaching Assistant 2021

MIT School of Humanities, Arts, and Social Sciences Levitan Teaching Award 2021

MIT Presidential Fellow 2016

Phi Beta Kappa 2016

PRESENTATIONS

ASSA Annual Meeting 2022

Econometric Society Summer School, Hokkaido University 2019

International Conference on Game Theory, Stony Brook University 2019

IO Theory Conference, UC Berkeley 2019

PUBLICATIONS

“Justified Communication Equilibrium” (with Drew Fudenberg), American Economic Review (111), 3004-3034, 2021

“Record Keeping and Cooperation in Large Societies” (with Drew Fudenberg and Alexander Wolitzky), Review of Economic Studies (88), 2179-2209, 2021

“Indirect Reciprocity with Simple Records” (with Drew Fudenberg and Alexander Wolitzky), Proceedings of the National Academy of Sciences (117),
We study principal-agent settings where the principal has private information, both the principal and agent have actions, and the agent's action is subject to moral hazard. Unlike past work focusing on explicit contracts, we allow the principal to propose contracts that give them flexibility in their choice of future actions. We develop an adaptation of sequential equilibrium called “contracting equilibrium” for our principal-agent games, and we prove its existence. In environments where the principal's type and agent's action are complements, we also apply a refinement called “payoff-plausibility.” The “principal-optimal safe outcomes,” which are analogs of the least-cost separating outcomes of signaling games, are always contracting equilibrium outcomes, and they provide an important payoff benchmark in that every principal type must obtain a weakly higher payoff from any payoff-plausible equilibrium. Moreover, if there are complementarities between the principal's type and action, payoff-plausibility selects the principal-optimal safe outcomes when the principal is restricted to offering “deterministic” mechanisms. Otherwise, pooling between principal types can survive payoff-plausibility, and is more prevalent than would be predicted with explicit contracts.

“Robust Neologism Proofness”

We introduce robust neologism proofness, an equilibrium refinement that applies to both cheap-talk and costly signaling games. Robust neologism proofness eliminates equilibria that can be undone by a certain kind of credible communication from the sender to the receiver, formalized as a “credible robust neologism.” We show that robust neologism proof equilibria exist both in a class of “monotonic” signaling games and any signaling game where the sender can give a transfer to the receiver. Additionally, we apply robust neologism proofness to various examples and compare it with other equilibrium refinements. Finally, we show that in the special class of “monotone-concave-supermodular” signaling games with transfers, robust neologism proofness selects the “sender-optimal” separating equilibria.
“Adverse Selection with Ex-Post Signals”

http://economics.mit.edu/files/16573

We study adverse selection problems in which the agent’s type is two-dimensional and there is a contractible ex-post signal of one component of the agent’s type. We analyze the extent to which the principal can use the ex-post signal to mitigate the effects of the asymmetric information concerning this component, and we characterize when the principal can completely eliminate such effects and achieve the same payoff as in the benchmark where this component is public information. Using this characterization, we show that, under broad conditions, the principal can never achieve the same payoff as the public information benchmark with any ex-post signal that has only two realizations. However, the principal can achieve this payoff with ex-post signals that satisfy a “positive curvature criterion.” Throughout, we focus on the example of a firm employing an informed worker on a project, where the worker has superior information both about the difficulty of the project and the project’s potential quality.

“Incentive Compatibility with Non-Convex Type Spaces”

http://economics.mit.edu/files/16577

We present results concerning the incentive compatibility of mechanisms when the agent’s type space may not be convex. In particular, we provide a necessary condition for incentive compatibility when the agent’s utility is convex in their type, a sufficient condition for incentive compatibility when the agent’s utility is concave in their type, and a necessary and sufficient condition for incentive compatibility when the agent’s utility is affine in their type. These results can be used to analyze screening problems that do not satisfy commonly imposed, but restrictive, assumptions such as the increasing differences condition, as we illustrate with examples.

“Learning and Induction in Games” (with Drew Fudenberg and Kevin He)

We examine the relationship between the equilibria that emerge in steady-state learning models and the concepts of backward and forward induction. In two-stage games of perfect information, every equilibrium that arises from learning satisfies backward induction. With more than two stages, learning does not always require backward induction, but backward induction must be satisfied when later-moving players are relatively “experienced and patient.” In games of imperfect information, strategies that are strictly dominated can be optimal experiments for agents to learn about the prevailing distributions of actions of other players. This can lead to equilibria that are eliminated by forward induction.
“Optimal Learning is Efficient Ex-Post” (with Drew Fudenberg)

We analyze the learning problem of a non-doctrinaire, Bayesian agent who chooses an action every period over an infinite time horizon and is uncertain about the underlying distributions of payoffs induced by their actions. Assuming that the agent at least observes their payoff every period, we show that, as the agent becomes perfectly patient, any optimal policy gives them an expected discounted payoff that uniformly converges to their expected payoff from their optimal action.
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PRIOR EDUCATION
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MA, Part III Mathematics, Distinction 2015

University of Chicago
B.A, Mathematics, 3.99/4.0 2014

CITIZENSHIP USA

LANGUAGES English (native), Mandarin (fluent)

FIELDS Primary Fields: Econometrics
Secondary Fields: Industrial Organization
**TEACHING EXPERIENCE**

- **Applied Econometrics** (graduate, MIT course 14.381), Teaching Assistant to Professor Whitney Newey  
  - 2020

- **Statistical Methods in Economics** (graduate, MIT course 14.380), Teaching Assistant to Professor Anna Mikusheva  
  - 2020

- **Intro to Statistical Methods in Economics** (undergraduate, MIT course 14.30), Teaching Assistant to Professors Whitney Newey and Alberto Abadie  
  - 2019

**RELEVANT POSITIONS**

- Research Assistant to Professor Michael Whinston  
  - 2018

- Research Assistant to Professor Glenn Ellison  
  - 2018

**FELLOWSHIPS, HONORS, AND AWARDS**

- MIT Presidential Fellowship (2016)
- Phi Beta Kappa (2013)

**RESEARCH PAPERS**

“Designing Representative and Balanced Experiments by Local Randomization” (Job Market Paper)

This paper studies treatment effect estimation in a novel two-stage model of experimentation. In the first stage, using baseline covariates, the researcher selects units to participate in the experiment from a sample of eligible units. Next, they assign each selected unit to one of two treatment arms. We relate estimator efficiency to representative selection of participants and balanced assignment of treatments. We define a new family of local randomization procedures, which can be used for both selection and assignment. When used for treatment assignment, this family nests stratified block randomization and matched pairs, the most commonly used designs in practice in development economics, but also produces many useful new designs, embedding them in a unified framework. When used to select representative units into the experiment, local randomization boosts effective sample size, making estimators behave as if they were run in a larger experiment. When used for treatment assignment, local randomization does model-free non-parametric regression adjustment by design. We give novel exact inference methods for locally randomized selection and assignment, allowing experimenters to report smaller confidence intervals if they designed a representative experiment. We apply our methods to the setting of two-wave design, where the researcher has access to a pilot study when designing the main experiment. We use local randomization methods to give the first fully efficient solution to this problem.
“Local Randomization Dominates Rerandomization: Implications for Table One”

As evidence of balance, experimentalists often present “Table 1” showing that the average of baseline covariates between treatment and control units is similar. This can be achieved by rerandomization: resampling candidate treatment assignments until Table 1 looks balanced. This paper shows that such rerandomization procedures, based on global balance criteria, are generically inefficient. Because of this, the information about covariate balance, and thus estimator precision, conveyed by Table 1 is limited. As a result, we suggest experimenters present alternative “local” measures of balance.

To show our inefficiency result, we study rerandomization with candidate treatment assignments drawn from a large family of local randomization distributions, introduced in Cytrynbaum (2021). Local randomization refers to stratified designs with fine, data-adaptive strata, and strictly nests classical designs like matched pairs. We show that rerandomizing candidate treatment assignments drawn by local randomization does semiparametric regression adjustment by design. The nonparametric component of the regression is produced by the set of locally balanced covariates, while the linear component is due to the covariates in the rerandomization criterion. By contrast, a design without rerandomization that instead locally balances both sets of covariates gives joint non-parametric control, with (generically) strictly smaller asymptotic variance.

“Blocked Clusterwise Regression”

A recent literature in econometrics models unobserved cross-sectional heterogeneity in panel data by assigning each cross-sectional unit a one-dimensional, discrete latent type. Such models have been shown to allow estimation and inference by regression clustering methods. This paper is motivated by the finding that the clustered heterogeneity models studied in this literature can be badly misspecified, even when the panel has significant discrete cross-sectional structure. To address this issue, we generalize previous approaches to modeling discrete unobserved heterogeneity by allowing each unit to have multiple, imperfectly-correlated latent variables that describe its response-type to different covariates. We give inference results for a k-means style estimator of our model and develop information criteria to jointly select the number clusters for each latent variable. Monte Carlo simulations confirm our theoretical results and give intuition about the finite-sample performance of estimation and model selection. We also contribute to the theory of clustering with an over-specified number of clusters and derive new convergence rates for this setting. Our results suggest that over-fitting can be severe in k-means style estimators when the number of clusters is over-specified.

“Using Lattice Geometry to Find all Stable Allocations”

In this paper, we give an algorithm to find all core allocations in a general model of multilateral many-to-many matching with contracts. We develop a notion of information sharing in lattices, showing how lattice geometry can be exploited to produce a relatively fast algorithm that returns the full set of core outcomes. We show how to apply our technique to more general economic problems and, as an application, construct the first algorithm to find all stable allocations in bilateral matching with contracts markets when agents have substitutable preferences.
This paper studies the optimal experimental design for a fixed weighting estimator of the ATE, asking whether one can use a pilot experiment to “estimate what to balance.”

We show that there exists a one-dimensional moment condition on the treatment variables that gives the minimal sufficient condition for unbiasedness of the estimator. This moment condition captures the exact (unknown) function of the covariates that we need to balance at a fixed DGP. The degrees of freedom left after imposing this condition can be used to exploit efficient revelation effects: optimally revealing the less noisy potential outcomes. Thus, the oracle design solves a linear program: optimizing the revelation effect subject to the minimal, unconditional moment constraint. By contrast, inverse propensity weighting imposes a stronger conditional moment restriction, wasting these degrees of freedom. Because of this, the optimal propensity score is not equal to the estimator weights. We propose a feasible linearly constrained quadratic program (LCQP) that uses pilot data to mimic the oracle design LP. The extra quadratic term regularizes our estimate of the oracle LP, accounting for the additional variance due to pilot estimation of the oracle moment condition. We give asymptotics showing that such a strategy generically improves on the naive propensity weighting approach.
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2014

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GENDER:
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FIELDS
Primary Fields: Public and Health
Secondary Fields: Labor

TEACHING EXPERIENCE
14.41: Public Finance and Public Policy (undergraduate)
Teaching Assistant to Professor Jonathan Gruber
2019

14.472: Public Economics II (graduate)
Teaching Assistant to Professor Amy Finkelstein
2019
RELEVANT POSITIONS
Research Assistant to Professor Amy Finkelstein 2017-19
Stanford Law School Research Fellow: Research Assistant to Professor Daniel Kessler 2014-16

FELLOWSHIPS, HONORS, AND AWARDS
NBER Pre-Doctoral Fellowship in Aging and Health 18-20, 21-22
National Science Foundation Graduate Research Fellowship 2016-2021
UCD Economics Distinguished Undergraduate Student 2014
UCD Economics Departmental Citation 2014
Phi Beta Kappa 2013
UCD Regent’s Scholarship 2010-2014
National Merit Scholarship 2010

PROFESSIONAL ACTIVITIES
MIT Labor Lunch co-organizer 2018-19
NBER health and aging Trainee Seminar organizer 2019-20

PUBLICATIONS
“Medicare Advantage Plans Pay Hospitals Less Than Traditional Medicare Pays,” (with M. Kate Bundorf, Laurence Baker, and Daniel Kessler) *Health Affairs* 35.8 (2016): 1444-1451


RESEARCH PAPERS
“Volume Responses to Changes in Medicare Reimbursement” (Job Market Paper)
I investigate how Medicare reimbursement affects utilization. Theoretically the impact of reimbursement on utilization could be either negative or positive depending on whether provider substitution effects, provider income effects, or demand effects dominate. And the empirical literature has found mixed results. I use a triple difference model and reimbursement variation from a 2011 policy change that increased reimbursement for some specific procedures in four states. I next evaluate whether demand contributes to the estimated elasticity by repeating the analysis on subsets of the market where demand is likely inelastic.
“Telemedicine Persistence in Medicare: Utilization Patterns before COVID”
Telemedicine increased dramatically during the COVID-19 pandemic introducing the modality to many patients and providers. To understand how exposure to telemedicine affects subsequent utilization, I examine persistence with telemedicine in pre-COVID Medicare. I analyze patient and provider telemedicine visits in Medicare from 2006 to 2016, a sample where telemedicine was predominantly used in rural areas and for mental health conditions. I measure patient persistence by the share of care provided via telemedicine over time and compare this to in-person persistence with a unique provider. Similarly, I evaluate provider persistence by the share continuing to provide telemedicine and the share of visits via telemedicine after a first visit. Patients were somewhat persistent: for mental health visits in particular, the share via telemedicine fell by about one-third from over 60% at the first visit to 40% the next quarter and then again fell by about half to 20% three years later, while in a matched comparison group, the share of in-person visits to the same provider fell by roughly half as much from 64% to 44% over three years. The selected subset of patients whose initial providers continued to provide any telemedicine, a group more likely to retain access, were quite persistent. Providers were somewhat more persistent than the average patient though results varied by specialty. If telemedicine were a valuable experience good then exposure should lead to increased or persistent utilization in the absence of other constraints. My results suggest this is not the case and that supply constraints were a limiting factor. The policy implication is that COVID’s impacts on future telemedicine may stem from changes in the supply side regulations and reimbursement rather than from exposing potential patients to the modality, so maintaining those changes is likely necessary to maintain higher telemedicine levels.

“Urgent Care Clinics, Ownership, and Health Care Efficiency” (with Annetta Zhou)
Over the past few decades retail and urgent care clinics have increased in number dramatically. These clinics increase access to care and previous research shows that they can cause people to substitute out of emergency rooms, but it is unknown how they impact total spending because they reduce the hassle cost of care and exacerbate ex post moral hazard for people with health insurance. There is heterogeneity in both the locations and health system membership of these clinics—-independent clinics compete with the emergency rooms, while clinics in the same health system as the nearby emergency rooms have other primary goals. In this project we use events studies around clinic openings in Massachusetts to investigate the impacts of the clinics as well as how such impact varies with these differences in market structure. Using the All-Payer Claims Database in years 2012 to 2016 we observe 89 urgent care clinics and 26 retail clinics opening. We interact clinic ownership with the event study to investigate differential impacts on emergency room substitution, substitution from providers offices, changes in aggregate care, and referrals to other system providers.
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**PRIOR EDUCATION**  
Mount Holyoke College  
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**LANGUAGES**  
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**FIELDS**  
Primary Fields: Development and International Trade  
Secondary Fields: Labor Economics
**TEACHING EXPERIENCE**

Math Camp for MIT’s DEDP Master’s Program 2021

15.027 – Opportunities in Developing Economies (MIT Sloan) 2021
Teaching Assistant to Professor Tavneet Suri

**RELEVANT POSITIONS**

Evidence for Policy Design 2021-
Post-Doctoral Research Fellow present

Abdul Latif Jameel Poverty Action Lab Graduate Research Assistant to Professor Benjamin A. Olken 2016-21

National Bureau of Economic Research Full-time Research Assistant to Professors Joshua Angrist and Parag Pathak 2014-15

Innovations for Poverty Action Part-time Research Assistant to Professor Michael Kremer 2014-15


**FELLOWSHIPS, HONORS, AND AWARDS**

George and Obie Shultz Fund at MIT 2019
MIT Graduate Fellowship 2016
MIT Ida Green Fellowship 2015
Phi Beta Kappa (early induction) 2011
Susan Cane Stone ’46 Scholarship 2011
Nancy Lewin ’80 Scholarship 2010
C. V. Starr Scholarship 2010
Eulalia Donoso Conde Scholarship 2010
Sarah Williston Prize 2010
MHC International Internship Program Grant 2009
Gina Jacobsen Prize in Mathematics 2009
Datatel Scholarship – Highest Prize 2009
Hubbell Prize for Excellence in French 2009
Laurel Fellowship for Study Abroad 2009

**PROFESSIONAL ACTIVITIES**

**Publications**

“Tax Administration vs. Tax Rates: Evidence from Corporate Taxation in Indonesia” (with M. Chatib Basri, Rema Hanna, and Benjamin Olken).

*Forthcoming in the American Economic Review.*

We compare two approaches to increasing tax revenue: tax administration and tax rates. We show that when Indonesia moved top regional firms into “Medium Taxpayer Offices,” with high staff-to-taxpayer ratios, tax revenue more than doubled. Examining non-linear changes to corporate income tax rates, we estimate an elasticity of taxable income of 0.579. Combining these estimates, improved tax administration is equivalent to raising rates on affected firms by 8 percentage points. On net, improved tax administration can have significant returns for developing countries.

**Research Papers**

Trade, Labor Market Concentration, and Wages (Job Market Paper)

Growing evidence suggests that trade liberalization has large negative effects on wages in labor markets more exposed to import competition. Why? I study one potential mechanism: increased firm labor market power. I show that the effect of trade on a market's average wage markdown can be quantified by two parameters: the effect of trade on labor market concentration, and the gap between workers' cross-market vs. within market cross-firm inverse elasticities of substitution. I then use employer-employee linked data and Brazil’s 1990s trade liberalization to estimate these key parameters. I highlight three findings. First, firms had substantial market power before liberalization: workers took home only 49 cents of every marginal dollar they generated. Second, trade increased labor market concentration, an effect driven by employment reallocation to higher-paying exporting firms. Third, this increased concentration raised firm labor market power, which offset wage gains from the reallocation to higher-paying firms. However, the magnitude of this market power effect was small, accounting for only 2% of the overall negative effect of trade on wages. The overall effect was instead driven by within-firm reductions in the marginal revenue product of labor.

A Simple Model of Labor Market Concentration under Absolute and Comparative Disadvantage

Do absolute and comparative advantage influence the effect of trade on labor market concentration? Yes. I show that unilateral import tariff reductions unambiguously increase labor market concentration in a two-sector economy whose absolute and comparative disadvantage lie in the protected sector. As countries tend to protect the sectors in which they are less competitive, this simple model illustrates how labor market concentration may increase in response to trade liberalization not only via within-sector employment reallocation towards more productive firms (e.g., as in Melitz (2003)), but also via cross-sector employment reallocation towards comparative advantage sectors.
Labor Market Consequences of Domestic Outsourcing: Evidence from Legalization in Brazil (with Michael Wong)

We leverage Brazil's unexpected legalization of outsourcing in 1993 to quantify the effects of domestic outsourcing on labor markets. We focus on security guards, the only major occupation to experience a large increase in outsourcing following legalization. First, we show that legalization led to a wave of occupational layoffs. Incumbent security guards affected by these layoffs moved to lower-wage firms and experienced persistent wage reductions. Second, we estimate the market-level effects of outsourcing legalization using a triple-difference specification that leverages regional variation in pre-legalization permissiveness of labor courts and compares security guards with less impacted occupations. We find that outsourcing legalization reallocated jobs from older to younger workers, increased total employment of guards by 8-15%, and raised their wages by 2-4%. Interpreted through an economic framework, our results imply that outsourcing legalization not only redistributed firm wage premia, as emphasized in recent literature, but it also generated substantial efficiency gains. If laid-off incumbent workers were fully compensated for their earnings losses, social breakeven would be achieved in one to five years.

Charter Schools and Suspensions: Evidence from Massachusetts Chapter 222

I evaluate the impact of Massachusetts Chapter 222—a policy that limited charter schools’ ability to suspend students—on student suspensions and test scores. Comparing charter attendance effects before vs. after Chapter 222, I find that Chapter 222 reduced charter suspensions by roughly 10 percentage points, but had no impact on charter learning. I then use variation in lottery offers and applicants’ pre-lottery suspensions to separate the effect of suspensions from that of charter attendance on test scores. Suspensions appear to be unrelated to achievement in charters, while the causal effect of charter attendance on test scores is large and positive.

Trade Liberalization and Modern Slavery: Evidence from Labor Inspections in Brazil

Over 49,816 workers have been freed from near-slavery working conditions in Brazil since 1995, the year the Ministry of Labor began inspecting locations following anonymous tip-offs. At the same time, recent evidence suggests Brazil's 1990s trade liberalization increased firm labor market power in markets more exposed to import competition (Felix, 2021). I investigate the relationship between Brazil's trade liberalization and the incidence of near-slavery conditions by matching the import competition exposure shocks from Felix (2021) to the Ministry of Labor's Dirty List ("Lista Suja") datasets spanning 1995-2015, which list all firms—as well as the number of freed workers per firm—found to employ workers in near-slavery conditions. My findings will contribute to growing literatures on the relationship between trade and firm labor market power.
A Quasi-Experimental Approach to Identifying Labor Market Boundaries: Evidence from Brazilian Workers (with Sean Wang)

What constitutes a local labor market? We develop a general framework that allows the matching of workers to jobs to be frictional and depend arbitrarily on their geography, industry, occupation, and other firm characteristics. Furthermore, we consider the possibility that workers’ job transitions reflect both movements within labor markets as well as reallocation across labor markets. Within this framework, mobility patterns of workers based on all realized job transitions would overstate the size of the local labor market for workers. We empirically test for workers’ local labor market boundaries in Brazil using linked employer-employee data by following workers’ realized mobility choices after idiosyncratic firm layoffs. Preliminary evidence highlights that a substantial portion of workers’ job transitions reflect reallocation across local labor markets. Exogenously separated workers are half as likely to change occupations as opposed to changing municipalities or industries, whereas estimates based on all job transitions would have concluded the opposite. Our results highlight occupations as distinct from geography or firm characteristics, and particularly important for defining workers’ relevant outside options.

Do public sector jobs crowd out talent from more productive activities?

Governments employ sizable shares of formal sector workers in emerging economies, where posts are typically allocated through highly competitive civil service exams. Civil service is perceived as prestigious, salaries are high, and workdays are shorter than in private sector jobs for similarly skilled workers. On the one hand, high salaries may be necessary to attract skilled labor. On the other hand, the screening process and/or the job itself (often clerical) may steer talent away from more productive activities. This project quantifies by how much highly competitive civil service exams crowd out skilled workers from more productive activities in Brazil. I exploit cross-state and cross-year variation in civil service job openings induced by civil service retirement to test whether exposure to civil service demand affects the job search behavior of skilled workers, as well as their employment and monthly earnings. Using Brazil’s PNAD dataset for 1992-2015 and instrumenting the opening of new civil service slots with retirement of veteran civil servants, I find preliminary evidence that skilled workers are less likely to be employed in years where new civil service slots are opened, and that roughly 20%-30% of those workers report “taking or preparing for civil service exam” as the measure taken to leave unemployment.
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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, June 2021
DISSERTATION: “Essays on Spatial Labor Markets and Public Policies”

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PRIOR EDUCATION
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MSc Analysis and Policy in Economics, Summa cum laude 2015
MSc Probability and Statistics, Summa cum laude 2014

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GENDER: Female

FIELDS
Spatial Economics, Labor Economics, Public Finance

TEACHING EXPERIENCE
Econometrics (14.32) 2021
Teaching Assistant to Professor Josh Angrist
International Economics II (14.582) 2019
Teaching Assistant to Prof. Arnaud Costinot and David Atkin
Kaufman Teaching Certificate Program (KTCP)  
MIT Teaching + Learning Lab

RELEVANT POSITIONS
- Research Assistant to Professor David Autor  2017-2019
- Research Assistant to Professor Dave Donaldson  2018
- Research Assistant to Professor Jean Tirole  2014-2015
- Research Assistant to Professor Thomas Piketty  2014-2015

FELLOWSHIPS, HONORS, AND AWARDS
- Post-Doctoral Fellow on Tax Competition and Business Taxation NBER  2021-2022
- Pre-Doctoral Fellow on the Economics of an Aging Workforce NBER  2019-2021
- Future of Work Fellowship, OECD  2018
- Charles M. Vest Presidential Fellowship, MIT  2016-2018
- Full Funding, ENS  2011-2015
- Bronze Medal, 49th International Mathematical Olympiad  2008
- 4th Accessit, Concours Général de Mathématiques  2008

RESEARCH GRANTS
- George and O’Bie Shultz Grant, MIT  2018-2020

INVITED PRESENTATIONS
- Young Economist Symposium
- PhD Student Workshop in Urban Economics, OECD
- IZA Summer School
- UEA Annual Meeting
- EEA-ESEM Virtual
- SED
- NASMES
- Annual Search and Matching Conference

PUBLICATIONS
  We define generalized Pareto curves as the curve of inverted Pareto coefficients b(p), where b(p) is the ratio between average income above rank p and the p-th quantile Q(p). We use them to characterize income distributions. We develop a method to flexibly recover a continuous distribution based on tabulated income data as is generally available from tax authorities, which produces smooth and realistic shapes of generalized Pareto curves. Using detailed tabulations from quasi-exhaustive tax data, we show the precision of our method. It gives better results than the most commonly used interpolation techniques for the top half of the distribution.

RESEARCH PAPERS
- “Spatial Mismatch” (Job Market Paper)
  This paper develops a framework to study theoretically and quantitatively the welfare attributes of spatial mismatch, defined as a misalignment between where job seekers reside and suitable employment opportunities. In a quantitative urban model with frictional labor markets, spatial mismatch begets inefficiencies when commuting is costly and information about job offers decays with distance. I prove that both workers’ choice of residence and vacancy creation are inefficient in the decentralized equilibrium. There might then be too much or too little spatial mismatch, depending on whether commuting costs or information decay dominates. The constrained-efficient allocation may be
restored by a mix of moving-to-opportunity and enterprise zone interventions. I apply my model to French urban ghettos and I leverage a spatial experiment to estimate it. I can then establish that inefficiencies due to spatial mismatch raise unemployment by 2.1% and reduce welfare by 4.2pp in France. I show through the lens of my model that the enterprise zone program supposed to undo spatial mismatch in French urban ghettos partly succeeded, but the gains were limited to targeted neighborhoods. Finally, I explore a range of counterfactual policies designed to tackle spatial mismatch.

“No Country for Young Men: The Inversion of the Rural-Urban Age Gradient in the United States, 1950-2019” (with David Autor)
In 1950, residents of the most rural U.S. counties were on average 4.5 years younger than residents of the most urban counties; seven decades later in 2019, they were 2.7 years older, a swing of 7.2 years. This inversion of the rural-urban age gradient unfolded in two steps. Between 1950 and 1990, net migration of young adults ages 18-24 slowed aging in cities, while ‘suburbanization’ of prime-age adults and their dependent children accelerated aging in both cities and rural areas while rejuvenating suburbs. After 1990, net migration flows across rural areas, suburbs, and cities decelerated sharply, a force that should have raised the relative age of cities. This did not occur, however, because decelerating migration was driven by slowing urban outflows of prime-age adults and their dependent children rather than slowing urban inflows of young adults. Though frequently read as a sign of flagging economic dynamism, the slowdown of net migration over the last three decades reflects the rising share of prime working years that adults spend in cities.

“Redistribution through Housing Assistance,” (with Hector Blanco)
We examine the distributional implications of the shift from public housing to subsidized private housing initiated by the U.S. government over the past few decades. We build a quantitative urban framework where housing assistance complements income taxation to redistribute across workers. We argue that provision of affordable housing involves a trade-off between indirect pecuniary redistribution and direct amenity spin-offs. On the one hand, public housing drives local rents down, while amplifying the spatial concentration of poverty. On the other hand, project- and tenant-based rental assistance enhances the local amenities of subsidized households by promoting mixed-income communities, but pushes private landowners’ rents up.

“Tax Discrimination with Competition: The Market for Firms”
(with Cailin Slattery)

“Spatial Mismatch and Job Suburbanization: Evidence from the U.S.”
(with Laura Zhang)
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PhD, Economics, Expected completion June 2022
DISSERTATION: “Killer Lenders: The Impact Lender Discretion and Coordination Friction on the Consequences of Debt Covenant Violations”

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PRIOR EDUCATION
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Summa Cum Laude

CITIZENSHIP
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LANGUAGES
English, Chinese
FIELDS

Macroeconomics, Finance

TEACHING EXPERIENCE

14.01: Introduction to Microeconomics
Teaching Assistant to Jonathan Gruber, Sara Ellison
Fall 2018, Fall 2020, Spring 2021, Fall 2021

14.471: Public Economics
Teaching Assistant to Ivan Werning and Jim Poterba
Fall 2018

15.472: Advanced Asset Pricing
Teaching Assistant to Dan Greenwald, Jonathan Parker
Fall 2019

14.03: Microeconomic Theory and Public Policy
Teaching Assistant to Nikhil Agarwal
Spring 2021

FELLOWSHIPS, HONORS, AND AWARDS

NSF Graduate Research Fellowship Program (2016)
David A. Wells Prize in Political Economy (2016)
Carl Van Duyne Prize in Economics (2015)

PUBLICATIONS

“Debt Collateralization, Capital Structure, and Maximal Leverage”

RESEARCH PAPERS

“Killer Lenders: The Impact Lender Discretion and Coordination Friction on the Consequences of Debt Covenant Violations” (Job Market Paper)
Using a new dataset of firm covenants and debt violations, I find that, non-firm characteristics matter for borrower performance after a debt covenant violation. Cross-default provisions in debt contracts create a coordination problem among different syndicated lending groups. Firms with more active packages experience a sharper and decline in debt issuance and make fewer investments following a violation. Lenders also differ in their propensity to send firms into different violation outcomes. Firms that have pre-existing lending relationships with harsh lenders are charged higher interest rates on new debt.
Collateral Contraints, Tranching, and Price Bases (2021)
Using a multi-state, general equilibrium model, I show that price bases can occur between the prices of portfolios with identical cash flows when there is a difference in the collateral capacity of the underlying assets. Assets that can back multiple simultaneous contracts command a premium. Our theory predicts correctly predicts that inclusion into a CDX index increases the underlying CDS basis.

RESEARCH IN PROGRESS “Debt Structure, Monetary Policy, and Investment”
There is considerable heterogeneity in debt structure across firms, specifically with regards to secured versus unsecured debt. A majority of firms hold both types of debt even while they have additional pledgeable capacity, despite secured debt being a safer and cheaper form of financing. I find that firms with a higher fraction of their assets pledged respond more strongly to contractionary shocks but there is no difference in response to expansionary shocks. I then use a simple model to show that firms will endogenously arrive at these different levels of secured and unsecured debt due to differences in their expected future investment opportunities. In the model, firms that need to take on unsecured financing are less likely to invest after a contractionary shock, due to the higher cost of financing.
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DISSERTATION: “Essays in Education Finance”

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PRIOR EDUCATION
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AB in Economics (High Honors) and Government (High Honors)
Summa Cum Laude

CITIZENSHIP
United States

GENDER
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FIELDS
Primary Field: Public Finance
Secondary Fields: Education, Household Finance
Economics and Psychology (undergraduate, MIT course 14.13) 2020
Teaching Assistant to Professor Frank Schilbach

Econometric Data Science (undergraduate, MIT course 14.32) 2019
Teaching Assistant to Professor Anna Mikusheva

Advanced Research and Communication (graduate, MIT course 14.192) 2019
Teaching Assistant to Professors Esther Duflo and Stephen Morris

Topics in Money and Finance (undergraduate, Dartmouth course ECON 46) 2015
Teaching Assistant to Professor Bruce Sacerdote

Econometrics (undergraduate, Dartmouth course ECON 20) 2012-2015
Study Group Leader for Professor Ethan Lewis

RELEVANT POSITIONS
Research Assistant to Professor Jonathan Parker 2018-2020
Research Assistant to Professor Emil Verner 2018
Analyst, Cornerstone Research 2015-2017
Research Assistant to Professor Brendan Nyhan 2013-2014

FELLOWSHIPS, HONORS, AND AWARDS
Jerry A. Hausman Graduate Dissertation Fellowship 2021-2022
George and Obie Shultz Fund Grant 2019
National Science Foundation Graduate Research Fellowship 2017-2022
Jonathan B. Rintels Prize (best thesis in the social sciences) 2015
Lewis H. Haney Prize (best Economics thesis) 2015
Bennett Essay Prize (best thesis in political theory) 2015
Nelson A. Rockefeller Prize (best overall Economics major) 2015
Phi Beta Kappa (early induction, top 20 in class) 2014
Rufus Choate Scholar (top 5% in class) 2011-2015
Best Undergraduate Paper on the Presidency (American Political Science Association) 2014

PROFESSIONAL ACTIVITIES
Referee for American Economic Review: Insights 2020-2021
MIT Public Finance Lunch organizer 2020-2021

Presentations:
International Association for Applied Econometrics Annual Conference, International Institute of Public Finance Annual Congress, Washington University in St. Louis Economics Graduate Student Conference 2021

RESEARCH PAPERS
“Interstate Competition in Higher Education and the Allocation of Financial Aid” (Job Market Paper)
In the American higher education structure, public universities are funded and operated at the state level. I present theoretical and empirical evidence that the resulting competition between state university systems causes socially costly distortions to the allocation of financial aid among undergraduate students. In a model drawing intuition from the traditional tax competition literature, I demonstrate that business-stealing incentives lead states to provide less need-
based and more merit-based aid than a national social planner who seeks to maximize aggregate college attendance. To permit empirical tests of the model, I derive additional comparative statics relating equilibrium aid allocation to students’ interstate migration costs: when migration is easier and states are able to compete more intensely for each other’s students, they move further from socially optimal policy by decreasing need-based and increasing merit-based funding. Using student-level financial aid data and a variety of measures – geographic distance, membership in tuition reciprocity agreements, and annual university rankings – to proxy for students’ migration costs, I find broad confirmatory evidence that heightened competition shifts aid dollars away from need-based grants and low-income students. A quantification exercise suggests that college-attendance rates would increase by 7-11 percentage points for low-income students and by 2-3 percentage points overall under socially optimal financial aid policy.

“Modeling the Spending and Welfare Effects of School Finance Reforms”
School districts in the United States rely on both funding from state governments and their own local tax collection. The dual nature of education funding complicates the analysis of school finance policy, since districts can adjust their local revenue collection in response to state funding changes and use accumulated savings buffers to divorce spending choices from current revenue levels. Focusing on the helpful institutional setting in the state of Ohio, I address this challenge and develop a method to evaluate the long-run consequences of school finance reforms. I first build a dynamic model of school district behavior and validate its reduced-form predictions about levy-proposal and spending-saving decisions. I then estimate the model, leveraging the large amount of annual variation in districts’ financial resources caused by historical volatility in state aid and a unique state law freezing the nominal value of local property tax revenue. The structural estimates allow me to simulate individual districts’ reactions to state funding changes and compute the resulting spending and welfare effects of counterfactual policy reforms. Differences in districts’ estimated preferences and initial financial conditions create substantial heterogeneity in the behavioral responses that determine the ultimate pass-through effect of state funding changes on spending levels. By targeting districts with the most favorable behavioral responses and the highest valuations of marginal funds, budget-neutral reallocations of state aid can attain welfare increases equal to 4% of Ohio’s current education expenditures.

“Arbitrage in the Binary Option Market: Distinguishing Behavioral Biases” (with Indira Puri)
In the first empirical analysis of the binary option market, we show that U.S. retail traders forgo clear arbitrage opportunities by purchasing binary options when strictly dominant portfolios of traditional call options are available at lower prices. Using a yearlong sample of binary option trades, we find that 19% of S&P index, 21% of gold, and 25% of silver trades violate our no-arbitrage condition. The amount of money lost is large, as buyers of binary options on average lose about a third of the contract price by forgoing the dominating call option portfolio. After rejecting standard institutional justifications for the existence of arbitrage,
including random price volatility and various forms of trading costs, we examine possible behavioral explanations. We show that our results cannot be explained by canonical behavioral models such as prospect theory or cumulative prospect theory. Instead, we rationalize our findings with a novel behavioral model in which investors prefer simple binary lotteries to more complicated sets of outcomes. An online survey of binary option traders supplements our analysis of market data, providing direct evidence that a “preference for simplicity” is more common among these traders than prospect theory preferences.

“Simple Allocation Rules and Optimal Portfolio Choice Over the Lifecycle”
(with Victor Duarte, Julia Fonseca, and Jonathan Parker)
We develop a machine-learning algorithm to solve for optimal portfolio choice in a detailed and quantitatively accurate lifecycle model that includes many features of reality modeled only separately in previous work. We use the quantitative model to evaluate the consumption-equivalent welfare losses from using simple rules for portfolio allocation across stocks, bonds, and liquid accounts instead of the optimal portfolio choices. We find that the consumption-equivalent losses from using an age-dependent rule as embedded in current target-date/lifecycle funds (TDFs) are substantial, around 3% of consumption, despite the fact that TDF rules mimic average optimal behavior by age closely (until retirement). The TDF portfolio does not improve on investing a constant 2/3 share in equity. Finally, optimal equity shares have substantial heterogeneity, particularly by wealth level and dividend-price ratio, implying substantial gains to further customization of advice or TDFs, particularly in these dimensions.
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DISSERTATION: Essays in Econometrics: Controlling for Unobserved Heterogeneity

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FIELDS
Econometrics

TEACHING EXPERIENCE
14.380 Statistical Methods in Econometrics (graduate) 2018, 2019
Teaching Assistant to Professor Anna Mikusheva
14.381 Applied Econometrics (graduate) 2019
Teaching Assistant to Professor Josh Angrist
14.382 Econometrics (graduate) 2018, 2019
Teaching Assistant to Professor Whitney Newey
14.385 Nonlinear Econometrics (graduate) 2018
Teaching Assistant to Professor Alberto Abadie

RELEVANT POSITIONS
 Reserve Bank of Australia, Financial Systems Group, Senior Analyst 2012-2016
 Research Assistant to Professor Whitney Newey 2018-2019
 Research Assistant to Professor Anna Mikusheva 2018

FELLOWSHIPS, HONORS, AND AWARDS
 MIT Department of Economics Jerry A. Hausman Graduate Dissertation Fellowship 2020
 University Medal, Economics Honours, UNSW 2012
 Scientia Scholarship, UNSW 2008

PROFESSIONAL ACTIVITIES
 Referee, Journal of Applied Econometrics

PUBLICATIONS
 The Role of Collateral in Borrowing, Reserve Bank of Australia RDP (2021). (with Nicholas Garvin and José-Luis Peydró)

We study the role of collateral in credit markets under stress. Australian interbank markets at the time of the Lehman Brothers failure present a unique platform for identification, because the collateral is liquid and homogenous across borrowers (unlike in retail credit markets), the shock is large and exogenous (unlike in countries with bank failures), and there is comprehensive administrative collateralized and uncollateralized loan-level data. After the exogenous shock, uncollateralized borrowing declines for ex ante riskier borrowers while collateralized borrowing increases for borrowers ex ante holding more high-quality collateral. Moreover, riskier banks with sufficient high-quality collateral substitute from uncollateralized to collateralized borrowing. In aggregate, collateralized borrowing expands substantially, predominantly collateralized against second-best (but still high quality) collateral, while interest rates on loans against first-best collateral fall substantially, indicating scarcity of the most liquid safe assets. This liquid asset demand encourages collateralized lending, contrary to cash hoarding.

RESEARCH PAPERS
 Estimating Nonlinear Models on Network Data with Unobserved Heterogeneity (Job Market Paper)

This paper considers estimation of a directed network model in which outcomes are driven by dyad-specific variables (such as measures of homophily) as well
as unobserved node-specific parameters that capture degree heterogeneity. I develop a jackknife bias correction to deal with the incidental parameters problem that arises in fixed estimation of the model. The jackknife approach is easily adaptable to different models, including binary and non-binary outcome variables, and allows estimation of average effects. I also show how it can be used to bias-correct fixed effect averages over functions that depend on multiple nodes, e.g. triads or tetrads in the network; as an example, I implement specification tests for strategic interactions across dyads, such as reciprocity or transitivity. In an application, I estimate a gravity model for import/export relationships across countries.

**The Higher-order Efficiency of Jackknife Bias Corrections in Panel Models** (with Jinyong Hahn)

We derive higher-order variance expressions for both the full-sample jackknife of Hahn and Newey (2004) and the split-sample jackknife of Dhaene and Jochmans (2015) in a static panel data model. The split-sample jackknife is shown to have larger higher-order variance. This difference in higher-order variances can be important in practice, particularly in settings where the time-series dimension $T$ is not large. In addition, the remaining bias (after bias correction) is larger for the split-sample estimator.

**RESEARCH IN PROGRESS**

**Estimating Linear IV Models with Many Endogenous Regressors**

Empirical researchers may wish to estimate models in which a number of variables are potentially endogenous. For example, many endogenous regressors naturally arise when endogenous treatment variables are interacted with covariates to capture heterogeneity in treatment effects. This paper extends existing results on linear IV estimation by considering asymptotics under which the number of endogenous regressors is allowed to grow with the sample size. I derive consistency and asymptotic normality results for the jackknife IV (JIVE) estimator of Angrist et al. (1999), as well as the heteroskedasticity robust k-class style estimators (including the HLIM and HFUL) of Hausman et al. (2009). In simulations, the HFUL estimator is shown to outperform others in models with both many endogenous regressors and many instruments.
CURRENT POSITION
Massachusetts Institute of Technology (MIT)
Postdoctoral fellow at Blueprint Labs, July 2021 – June 2022

DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Completed June 2021
Dissertation: “Essays on the Economics of Education”

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PRIOR EDUCATION
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Sciences Po Paris
Bachelor in Social Sciences, with honors 2013
Universite Paris IV Sorbonne
Bachelor in Philosophy, with honors 2013

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FIELDS

Primary Fields: Labor Economics

Secondary Fields: Economics of Education, Econometrics, Market design

TEACHING EXPERIENCE

Econometric Data Science (14.32/14.320) 2020
Teaching Assistant to Prof. Josh Angrist

Graduate Labor Economics I (14.661) 2018-19
Teaching Assistant to Profs. Josh Angrist and Daron Acemoglu

RELEVANT POSITIONS

MIT, Research Assistant to Profs. Parag Pathak and Josh Angrist (Blueprint Labs) 2018-19

MIT, Research Assistant to Prof. Esther Duflo 2017 (summer)

Bocconi, Research Assistant to Prof. Chiara Fumagalli 2016

Bocconi, Research Assistant to Prof. Guido Tabellini 2015-16

FELLOWSHIPS, HONORS, AND AWARDS

William T. Grant Foundation Research Grant “Understanding the Impact of Integration Policies in New York City Public Schools” 2020-23

Spencer Foundation Research Grant “Understanding the Impact of Integration Policies in New York City Public Schools” 2020-22

MITili Research Grant “Understanding the Impact of Integration Policies in New York City Public Schools” 2019-20

“Bonaldo Stringher” Scholarship from the Bank of Italy 2016-18

PROFESSIONAL ACTIVITIES

Referee for American Economic Review: Insights

RESEARCH PAPERS

“School Choice and Segregation” (Job Market Paper)

Most large urban school districts are segregated along racial and economic lines. Segregation persists despite the introduction of centralized school choice mechanisms, which allow students to choose from a large set of schools. This paper analyzes how school selection criteria and applicant preferences contribute to school segregation. I use recent screened-school admissions reforms and a structural model to study the contribution of school admission criteria to segregation in New York City middle schools. Two admissions reforms that reduced screening reduced economic and racial segregation, though at the cost of White and high-income students' exits. The reforms also changed application behavior in a manner that suggests applicants ignore incentives for truthful ranking when applying for seats in New York’s deferred acceptance match. I use data from the reform period to estimate a model of school demand that allows for strategic behavior and to predict the consequences of city-wide changes in admission criteria. The resulting estimates suggest that removing academic screening of applicants only modestly reduces school segregation. On the other hand, segregation falls dramatically when dropping admission criteria based on geographic proximity.
“Who Benefits from Selective School Attendance?”
The question of who benefits from selective school enrollment remains controversial. I show that Boston exam schools have heterogeneous effects on achievement. Impact differences are driven primarily by the quality of an applicant's non-exam-school alternative rather than by student demographic characteristics like race. Admission policies prioritizing students with the weakest schooling alternatives have the potential to increase the impact of exam schools on academic achievement. In particular, simulations of alternative admissions criteria suggest schemes that reserve seats for students with lower-quality middle schools are likely to yield the largest gains.

“Is Busing Worth the Trip? School Travel Effects in Boston and New York”
(with Joshua Angrist, Guthrie Gray-Lobe and Parag Pathak)
School assignment in Boston and New York City came to national attention in the 1960s and 1970s in the wake of court-mandated desegregation. Today, district-wide choice allows Boston and New York students to enroll far from home, perhaps enhancing integration. Urban school transportation is costly, however, and the integration and education consequences of this expenditure unclear. Motivated by high transportation costs, we estimate the causal effects of school distance and travel time on integration and human capital using an identification strategy that exploits the Boston and New York City school matches. Simulations of alternative assignment schemes suggest that a return to neighborhood schools is likely to increase same-race exposure district-wide by only a few percentage points. Instrumental variables estimates show larger integration effects for those who currently choose to travel, but longer travel times have little or no effect on test scores and college attendance. Consistent with this, IV estimates of the effects of peer race directly fail to support the view that exposure to non-minority peers increases school quality for minority students. On balance, therefore, our results show little downside to school assignment policies that favor neighborhood enrollment.

RESEARCH IN PROGRESS

“The Effect of Exposure to Diverse Peers on School Preferences” (with Viola Corradini and Guthrie Gray-Lobe)
Schools are a critical place for children to encounter people from other backgrounds and cultures. Yet, families’ choice of school determines student exposure to diverse peers. We aim to better understand how preferences over schools are shaped by past experience. Specifically, we evaluate whether attending a school with more diverse peers influences a student and her family’s preference to enroll in a more diverse school in the future. This informs the scope for school districts to support positive social interactions between groups through assignment policy.
CURRENT POSITION
Bits and Watts Postdoctoral Fellowship (Stanford) 2020-Present

DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, September 2020
DISSERTATION: “Essays on Electricity and Matching Markets”

DISSERTATION COMMITTEE AND REFERENCES

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PRIOR EDUCATION
Bilkent University 2017-2018
Visiting Student in Economics Department

Bilkent University 2014
B.A in Economics and Minor in Mathematics
Graduated as Salutatorian

CITIZENSHIP
Turkish

GENDER: Male

FIELDS
Primary Fields: Energy and Environmental Economics, Industrial Organization
Secondary Fields: Market Design
### Teaching Experience

<table>
<thead>
<tr>
<th>Course</th>
<th>Institution</th>
<th>Level</th>
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<th>Professor</th>
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<tr>
<td>14.76 Firms, Markets, Trade and Growth</td>
<td>MIT, DEDP Master’s</td>
<td>2020</td>
<td></td>
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</tr>
<tr>
<td>15.037-8 Energy Economics and Policy</td>
<td>MIT Sloan, MBA</td>
<td>2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 204 Microeconomics II</td>
<td>Bilkent University, Undergraduate Level</td>
<td>2018</td>
<td>TA to</td>
<td>Kevin Hasker</td>
</tr>
<tr>
<td>ECON 301 Econometrics</td>
<td>Bilkent University, Undergraduate Level</td>
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<td>TA to</td>
<td>Cavit Pakel</td>
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<tr>
<td>14.04 Intermediate Microeconomics</td>
<td>MIT, Undergraduate Level</td>
<td>2017</td>
<td>TA to</td>
<td>Juuso Toikka</td>
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<tr>
<td>14.14 Strategy and Information</td>
<td>MIT, Undergraduate Level</td>
<td>2017</td>
<td>TA to</td>
<td>Mihai Manea</td>
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<tr>
<td>ECON 516 Mathematics for Economists II</td>
<td>Bilkent University, Graduate Level</td>
<td>2014</td>
<td>TA to</td>
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<tr>
<td>ECON 439 Game Theory</td>
<td>Bilkent University, Undergraduate Level</td>
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<td>Kevin Hasker</td>
</tr>
<tr>
<td>ECON 442 Application of Graph Theory to Economics</td>
<td>Bilkent University, Undergraduate Level</td>
<td>2012</td>
<td>TA to</td>
<td>Semih Koray</td>
</tr>
</tbody>
</table>

### RELEVANT POSITIONS

- Research Assistant to Professor Nikhil Agarwal                    | 2014-2017

### Fellowships, Honors, and Awards

- ExxonMobil-MIT Energy Fellow                                       | 2018-2020
- Fulbright Fellowship                                                 | 2014-2016
- Bilkent University High Merit Scholarship                           | 2009-2014
- Ranked 2nd in Turkish University Entrance Exam, ÖSS                 | 2009

### Publications

“Large Scale Wind Power Investment's Impact on Wholesale Electricity Market” (Job Market Paper)

Renewable subsidies have been an influential device for wind power investment. These policies help to lower emissions by offsetting high-emitting electricity generation with clean energy. For zero-emission targets, this transition towards renewable power should be accompanied by thermal generators' retirement to set clean the energy mix in the power sector. In this paper, I build a framework to quantify the offset and revenue impact of large-scale wind power investment in a wholesale electricity market and apply it to study the South Australian Electricity Market. This equilibrium framework computes a supply function equilibrium using estimated best responses from conventional sources to observed variation in the residual demand volatility. I first show that reduced-form methods are biased as the scale of the additional capacity increases. My results highlight that with different investment sizes, the substitution patterns and revenue impact of wind power differ considerably. As the penetration level of wind power increases, the electricity becomes cheaper. The offset and negative shock shifts from low-cost inflexible generators to high-cost flexible generators, while the revenue impact is the highest on existing renewable generation. I also show quite a bit heterogeneity in price impact among different potential wind power projects. These results have some policy implications on renewable targets' long-run effects on the generation mix and the project selection given the subsidy scheme.

“Economics of Grid-Scale Energy Storage”

The transition to a low-carbon electricity system is likely to require grid-scale energy storage to smooth the variability and intermittency of renewable energy. I investigate whether private incentives for operating and investing in grid-scale energy storage are optimal and the need for policies that complement investments in renewables with encouraging energy storage. In addition to arbitraging inter-temporal electricity price differences, storage induces non-pecuniary externalities due to production efficiency and carbon emissions. I build a new dynamic structural equilibrium framework to quantify the effects of grid-scale energy storage and apply it to study the South Australian Electricity Market. My equilibrium framework adds key modeling features to the literature by allowing (1) storage's price impact and (2) incumbents to best response to energy storage's production. The best responses' estimation uses the best responses from conventional sources to observed variation in the residual demand volatility. We find that (1) ignoring price impact of energy storage may lead to large biases as arbitrage revenue diminish fast with the size, (2) although entering the electricity market is not profitable for privately operated storage, such entry would increase consumer surplus and reduce emissions, (3) load ownership for energy storage leads to twice as much improvement in consumer surplus, and (4) entry of energy storage reduces renewable generators' revenue by decreasing average prices at moderate levels of renewable power, however, for high renewable generation capacity levels, storage increases the return to renewable production and reduces CO2 emissions by preventing curtailment during low-demand periods.
“Leveling the Playing Field: Electricity Market Design with Energy Storage” (with Jing Li)
Ambitious penetration targets of renewable but intermittent electricity generation sources, such as solar and wind, present challenges to the reliability and resilience of power systems. Energy storage can facilitate the integration of these resources. This paper studies how electricity market regulations can be updated to allow for fair and efficient energy storage entry and participation by the full range of energy storage technologies. We specify a model of electricity generation and storage competition in wholesale electricity markets with locational marginal prices (LMPs). In the model, a storage operator maximizes profit (revenue stacking) by participating in energy, ancillary services, and capacity markets. Our model allows for different technologies of energy storage to express their comparative advantage arising from different technical specifications such as fixed costs, operating costs, roundtrip efficiency, power, and energy capacity. We build on Karaduman (2021) to endogenize the impact of storage participation on prices in wholesale electricity markets. We explore applying our model to data from PJM in the United States. From our estimates and model, we compute optimal locational capacity payments for different storage technologies.

“Competition of Matching Platforms” (with Arda Gitmez)
In this project, we investigate the inclination of dynamic matching platforms to constitute natural monopolies. We present a model of dynamic matching market with multiple platforms, where agents stochastically arrive and leave. Agents’ preferences are two-dimensional, with common preferences over time and heterogeneous tastes over the matching outcome. Each matching platform picks a matching policy, which endogenously generates gains from economies of scale. Agents choose a platform or platforms to participate at a cost. We argue that, given a level of participation cost, a natural monopoly occurs if and only if the preferences over time is salient compared to heterogeneous tastes. Moreover, an equilibrium with multiple platforms is sustained if participation costs are sufficiently high or if the tastes are sufficiently diverse. The results are suggestive of policy-relevant differences between several types of dynamic matching platforms, including dating and ride-sharing platforms.

“Is Productivity Transferable: Evidence from Power Sector M&A” (with Mert Demirer)

“Assessing the impact of large-scale EV adoption on wholesale electricity markets: A case study of Australia” (with Nicolas Astier)
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**MIT PLACEMENT ADMINISTRATOR**  
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**DOCTORAL STUDIES**  
PhD, Economics, Expected completion June 2022  
DISSERATION: “Essays on the Spatial Consequences of Public Policies”

**DISSERTATION COMMITTEE AND REFERENCES**

<table>
<thead>
<tr>
<th>Professor</th>
<th>Department</th>
<th>Address</th>
<th>Phone</th>
<th>Email</th>
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**PRIOR EDUCATION**

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<tr>
<th>Institution</th>
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<tr>
<td>Paris School of Economics</td>
<td>MA, Economics, <em>summa cum laude</em></td>
<td>2015-2016</td>
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<tr>
<td>University of California, Berkeley</td>
<td>Economics department, visiting student</td>
<td>Spring 2016</td>
</tr>
<tr>
<td>HEC Paris</td>
<td>MSc, Business Administration, dean’s list</td>
<td>2012-2015</td>
</tr>
<tr>
<td>Ecole Normale Superieure, Ulm</td>
<td>4-year fully-funded <em>normalien</em></td>
<td>2011-2016</td>
</tr>
<tr>
<td>Universite Paris-I Pantheon Sorbonne</td>
<td>BA, Econometrics, <em>summa cum laude</em></td>
<td>2011-2012</td>
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**CITIZENSHIP**  
French, Swiss

**GENDER:** Male
LANGUAGES
English, French, Spanish

FIELDS
Primary Fields: Public Finance, Spatial Economics

Secondary Fields: International Trade

TEACHING EXPERIENCE
14.01 Introductory Economics, MIT Fall 2021
Teaching Assistant to Professor Jon Gruber

Teaching Assistant to Professor Alp Simsek

Urban Economics, Sciences Po 2015
Teaching Assistant to Professor F. Gilli

RELEVANT POSITIONS
International Monetary Fund Internship Program 2018
Research Assistant to Profs A. Costinot and D. Donaldson 2017, 2020
Research Assistant to Prof. I. Werning 2016
EBRD – Economic Analyst, South Eastern Mediterranean 2014
Lazard – Analyst Intern, Sovereign Advisory Group 2013-2014

FELLOWSHIPS, HONORS, AND AWARDS
30 under 30 in France, Vanity Fair
C. Lowell Harris Fellowship, Lincoln Institute for Land Policy
International Economics PhD fellowship, Dartmouth College
IHS Fellowship
George and Obie Shultz Fund at MIT (joint with J. Moscona) 2017, 2020
George and Obie Shultz Fund at MIT (joint with P. Vautrey) 2016
Castle Krob International fellowship (MIT)
St-Gallen Symposium Wings of Excellence: top 5 essay (out of 1200) 2015
Adam Smith Fellowship
McKinsey Global Institute “Opportunity for Europe” Essay Prize
Kenan Sahin Presidential Graduate Fellowship (MIT) 2018
AFPSE Fellowship (Berkeley exchange program)
HEC Paris Dean’s List
HEC Paris: ranked 1st in the national admission contest 2017, 2020
Ecole Normale Superieure: ranked 1st in the national admission contest 2015

EXTERNAL PRESENTATIONS
LAGV conference (2021); European UEA (2021); Paris-2 Pantheon Assas
(2021); Paris School of Economics (2021); UEA Virtual Meetings (2020);
Dartmouth Tuck School of Business (2020); Urban Economics Association
Philadelphia Meetings (2019); IMF Internal Research seminar (2018); IMF
Western Hemisphere research seminar (2018).
Organizer: MIT Trade tea (2019-2020); “The future of the euro area”
(conference cycle, Ecole Normale Superieure, 2015)
### Tax Policy and Spatial Investment Behavior (Job Market Paper)

To alleviate housing costs in expensive locations, governments subsidize privately provided rental dwellings, balancing affordability for tenants and profitability for landlords. This paper demonstrates that spatial investment frictions in the rental housing market shape the response of individual landlords to place-based incentives. Building upon administrative data covering the universe of dwellings in France, their owners, and their occupants, I document that private rental housing, while crucial to worker mobility, is a highly frictional investment for savers. Investors own lumpy, un-diversified, and small amounts of housing, face idiosyncratic return differences, and strongly prefer nearby properties. In a stylized spatial equilibrium framework combined with a portfolio allocation choice rationalizing these features, the distribution of landlords’ own residence location matters for rental housing supply, as frictions reduce the private value of more remote housing investments. Due to these barriers, buy-to-let investment responses to tax changes vary systematically with a location's openness to external capital. Exploiting quasi-experimental evidence from an investment tax credit targeted at individual taxpayers, I evidence a substantial causal impact of subsidies on dwelling sales, new construction, and real estate activity. Subsidies increase the local housing stock with limited crowding-out effects, inducing in-migration of renters and population growth. They lead to substantial rises in land prices and developer profits, and reduce the price of competing older units. Finally, incomplete capitalization of the incentive in the price of new units, and a rise in long-distance investor involvement in treated areas, confirm the key mechanism of the model. Home bias in residential investment leads to imperfect capital mobility and shapes the allocation of people across space.

### Testing the Self-interested Voter: Evidence from a Promised Tax Cut

Narrow material campaign promises can win elections. This paper demonstrates that a promise to abolish a broad-based housing tax accounted for a substantial share of Emmanuel Macron's electoral success in the 2017 French presidential election. Using quasi-random spatial variation in the pre-reform tax burden across more than 35,000 municipalities, and instrumenting expected tax savings at the town level by formulaic real estate assessments established in the 1970s, I show that a one standard deviation (c. 1 percent of median household income) higher municipal exposure to the tax cut was associated with a c. 1 to 1.5 percentage point increase in the Macron vote share. In high-frequency online search, polling, and prediction market data, the timing of the promise coincided with a significant increase in voter information search, in Macron's polling intentions, and in his market-based predicted chances of victory. The results evidence the crucial role of distributive politics for marginal voters, even in elections marked by ideological polarization around non-economic issues.

### The Tax Elasticity of Capital Gains: Evidence from Millions of Housing Sales

I assess the impact of capital gains taxes on real estate, exploiting quasi-experimental variation and detailed data on millions of housing sales in France. In the short-run, investors delay sales and bunch transactions after anniversary
dates of their purchase, to benefit from more generous holding period deductions. After a 2012 reform substantially increased capital gain taxes on intermediate holding durations, exempting primary homes, transaction volumes for more exposed dwellings rose sharply between the announcement and implementation of the tax hike ("anticipation"), and dropped durably afterwards. The reform shifted the composition of sales towards lower-price appreciation units.

“Specializing in Density: Spatial Sorting and the Pattern of Trade” (with Jacob Moscona)
This paper tests whether a country's economic geography - in particular, the distribution of population across space - is an important source of comparative advantage. We develop a model in which sector-specific exports are determined by the distribution of productivity and factors of production within countries, and show how city-level data can be aggregated to measure determinants of country-level specialization. Countries with higher population-weighted population density specialize in sectors that benefit from agglomeration. Empirically, we estimate and find substantial variation within the US in the extent to which manufacturing sectors sort into dense locations. Combining this measure of "density affinity" with satellite data on the distribution of population, we find that both US states and countries with higher population-weighted population density disproportionately export in sectors with high density affinity. Even conditional on aggregate endowments, the geographic distribution of population within states and countries affects Ricardian comparative advantage.

“The Euro Area Phillips Curve”
Using data on local labor market conditions, I investigate the wage Phillips curve since the beginning of the European Monetary Union (EMU). After constructing measures of wage inflation in close to two hundred European NUTS-2 regions, I show that nominal wage growth responds strongly to local unemployment across labor markets in the monetary union. When unemployment is one percentage point higher in a region, nominal wage growth is reduced by 0.3 percentage points on average. The results are robust to the use of alternative proxies for slack in the labour market, including short-term unemployment, the employment-population ratio, and the output gap. I also report specifications taking into account various measures of inflation expectations, estimating a regional New Keynesian Phillips curve. Overall, my results suggest that the negative relationship between unemployment and nominal wage growth still holds in European local labor markets.

“Slack in the City: Optimal Unemployment Insurance with Spatial Heterogeneity”
Unemployment risk varies substantially across local labor markets, but unemployment insurance (UI) policies are designed at the State or federal level. In a standard model, the redistribution-efficiency trade-offs faced when designing optimal UI can be substantially affected by spatial heterogeneity. On the one hand, consumption smoothing gains depend on compensating price
differentials across places; on the other hand, local search externalities and directed mobility directly feed into the efficiency costs of UI benefits. In US data, I document strong co-movement of job opportunities, local price levels, and directed migration. Using variation in UI duration and maximum benefits allowance across states and time, I show that directed migration is dampened by more generous UI. Finally, I exploit discontinuities at state borders and the timing of sharp reductions in UI benefits to quantify the causal impact of UI on unemployment duration, local prices, and directed migration.

**RESEARCH IN PROGRESS**

*“Political Influence and Comparative Advantage across Space”* (with J. Moscona)

Is the unequal distribution of political influence across space — combined with the uneven geographic location of industries — an important determinant of economic performance and patterns of trade? Before the 1960s, US regions had vastly different amounts of representation per capita because districts were not re-drawn to reflect population movements. This changed in 1962-1964 following the Supreme Court’s one-person-one-vote decisions. We propose a model in which an industry’s political influence is determined by (i) its geographic distribution and (ii) the over/under-representation of the regions in which it operates. When re-districting is slow, non-comparative advantage sectors are over-represented in politics. Equalization of political influence leads to a reduction in trade barriers, and greater exports and output in industries that gain representation. We investigate the impact of representation using court-ordered re-districting as a natural experiment and combining newly constructed data on the distribution of industry employment in 1962, measures of industry-level trade and output, and historical maps of congressional districts and population distribution. Court-ordered re-districting led to an increase in exports and output in industries that gained representation. These industries also experienced abnormally high stock returns around the Supreme Court decision date. The structure of electoral systems and distribution of political power across space shapes patterns of output and trade.

*“Housing Regulations and Housing Demand”*

Building regulations induce monetary and compliance costs, and constrain the development of new housing and renewal of the existing stock. To estimate the response of housing demand to regulatory constraints, this paper studies a notched legislation in France exempting new construction from the requirement of using an architect, as long as its square footage remains below a threshold, a form of "attribute-based regulation" (Ito and Sallee, 2018). Using novel exhaustive administrative data on the universe of housing permits in France from 1973 to 2019, I evidence substantial distortions of the size distribution of homes: new units bunch below the notch, and extensions of existing dwellings are downsized in order not to exceed the threshold. The bunching response swiftly changes when the level of the threshold is moved, or its computation methodology adjusted. A regression discontinuity approach reveals that the cost of production jumps at the notch, while the composition of homeowners changes sharply, implying sorting of households by their taste for housing quality.
“Import Risk and Directed Innovation” (with J. Flynn and J. Moscona)
Import risk has the potential to shift the direction of US innovation. For example, recent fear of a possible rubber blight in South East Asia has led to a surge in the development of synthetic alternatives. We investigate whether there is a systematic relationship between domestic innovation and foreign risk. In a simple model of trade and innovation, we show (i) that an increase in import risk in a given sector increases domestic incentives to invest in R&D in that sector and (ii) that this effect is smaller for sectors that have a higher import elasticity of substitution. We take these two predictions to data and document both effects in the response of US sector-level patenting and firm level R&D spending to the concentration-weighted political risk of trading partners.

Selected Non-Academic Writing
Le risque calculé n’est pas une folie (Le Figaro, Apr. 2021)
La lenteur de la vaccination française est un symptôme de notre déclassement (Le Figaro, Jan. 2021)
A visa for the European dream (with V. Storchan, Le Grand Continent, Jul. 2020, prefaced by P. Aghion)
No taxation without misrepresentation (Le Grand Continent, Oct. 2019, a review of “The Triumph of Injustice”)
Targeted inflation targeting: A proposal to improve the ECB monetary framework (VoxEU, Jul. 2018)
La "bombe" de la flat tax : des estimations exagérées ? (Telos, Nov. 2017)
Reforming Europe by the people, for the people (McKinsey Global Institute Essay Prize Winner, Oct. 2016)
La Grece va-t-elle partir avec la planche a billets? (Le Monde, Jun. 2015)
Le short-selling a une utilité sociale (Contrepoints-Generation Libre, Aug. 2014)
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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2022
DISSERTATION: “Essays in Automation, Innovation, and Growth”

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PRIOR EDUCATION
Bocconi University
MSc in Economics and Social Sciences
110/110 cum laude
2015

Bocconi University
BSc in Economics and Social Sciences
110/110 cum laude
2013

CITIZENSHIP
Italian

GENDER
Male
Languages: English (fluent), Italian (native), French (fluent), Spanish (intermediate), German (beginner), Bengali (beginner)

Fields:
Primary Field: Macroeconomics
Secondary Field: Labor Economics

Teaching Experience:
- Labor Economics I (graduate, MIT course 14.661) Teaching Assistant to Professors Joshua Angrist, Heather Sarsons 2021
- Advanced Research and Communication (graduate, MIT Course 14.192) Teaching Assistant to Professors Esther Duflo, Stephen Morris 2021
- Advanced Research and Communication (graduate, MIT Course 14.192) Teaching Assistant to Professors Amy Finkelstein, Stephen Morris 2020
- Microeconomic Theory and Public Policy (undergraduate, MIT course 14.03) Teaching Assistant to Professors Tobias Salz (Fall), Nikhil Agarwal (Spring) 2019
- Microeconomic Theory and Public Policy (undergraduate, MIT course 14.03) Teaching Assistant to Professor Nikhil Agarwal 2018
- Principles of Macroeconomics (undergraduate, MIT course 14.02) Teaching Assistant to Professor Martin Beraja 2018

Relevant Positions:
- Research Assistant to Professor Daron Acemoglu (MIT) 2020
- Research Assistant to Professor Alp Simsek (MIT) 2019, 2018
- Research Assistant to Professor Martin Beraja (MIT) 2018
- Research Assistant to Professors Chiara Fumagalli and Tommaso Monacelli (Bocconi University) 2015
- Visiting Student at Innocenzo Gasparini Institute for Economic Research (IGIER) 2013-15

Fellowships and Awards:
Guido Cazzavillan PhD Fellowship, Full tuition and stipend fellowship (2016-2017)
Bocconi Graduate Merit Award. Full tuition scholarship, Bocconi University (2013-2015)

PROFESSIONAL ACTIVITIES


PUBLICATIONS


We study the economic incentives for automation when labor and machines are perfect substitutes. We show that labor is employed in production, even when it is a costlier input than robots, if: (i) firms face idiosyncratic risk, (ii) adjusting the stock of machines is costly, and (iii) workers can be hired and fired quickly enough. While labor survives, jobs become less stable, as workers are hired in short-lived bursts to cope with shocks. A calibration of our model to match US robot adoption data shows that lower robot prices produce negligible employment losses. By contrast, falling adjustment costs and rising robot productivity cause sizable disemployment effects. An extension of our model reveals that hiring and firing costs unambiguously depress long-run employment.


We argue that the US tax system is biased against labor and in favor of capital and has become more so in recent years, promoting levels of automation beyond what is socially desirable. Moving from the US tax system in the 2010s to optimal taxation of capital and labor would raise employment by 4.02 percent and the labor share by 0.78 percentage point and restore the optimal level of automation. More modest reforms can increase employment by 1.14–1.96, if coupled with an automation tax reducing the equilibrium level of automation. Indeed, marginal automated tasks bring about small productivity gains but reduce employment below its socially optimal level. We also show that reducing labor taxes or combining lower capital taxes with automation taxes can increase employment much more than the uniform reductions in capital taxes enacted between 2000 and 2018.
Inventors are a scarce resource, whose skill sets can apply to R&D in disparate product markets. Motivated by this observation, I explore the impact of product market competition on the misallocation of inventors, and its implications for growth. First, I delineate the boundaries of “knowledge markets,” using USPTO patents data to group NAICS sectors that employ the same inventors. Second, I analyze the relation between 4-digit NAICS sectors market concentration and the share of inventors employed in R&D projects relevant to these sectors. Four findings emerge from the analysis. First, the last twenty years saw a sizable increase in concentration of inventors across both patent (CPC) classes and their 4-digit sector of application. Second, over the period 1997-2012, increases in sector-level concentration are positively correlated with the share of inventor markets captured by each sector. An IV analysis using sector-specific regulations suggests a causal interpretation of this result. Third, sectors with increased inventor concentration have seen a decrease in the productivity of inventors, as measured by growth in output per worker. Fourth, higher inventor shares are positively correlated with self-citations and rising concentration of inventors at the top of the innovating firms distribution, and negatively with forward citations. A back-of-the-envelope computation suggest that increased inventors’ concentration in less competitive sectors can account for about 28% of the overall decrease in output per worker growth over the period 1997-2012 (0.79% in absolute value). To rationalize my findings, I propose a Schumpeterian model of creative destruction where incumbents can conduct defensive patenting. In the model, unbalanced increases in markups shift inventors towards less competitive sectors, and towards monopolistic firms carrying out R&D projects with the aim to erect barriers to entry. This shift reduces equilibrium inventors’ productivity and growth. I calibrate a two-sector version of this model to match moments of the inventor distribution and R&D spending in the US economy and study the optimal allocation of R&D subsidy for a planner wishing to maximize growth. I show that R&D subsidies provided to entrants in more concentrated sectors constitute the most effective policy, raising output by 0.31% in absolute value in the calibrated model (15% of the baseline in percentage terms).
“Employment Protection and the Direction of Technology Adoption”
(with Martina Uccioli), Submitted for Review
We study the impact of employment protection legislation (EPL) on firms’ innovation choices, through an event-study analysis of several labor market reforms occurring in Europe over 2000-2016. Data on firms’ technology adoption from the Community Innovation Survey reveal that substantial drops in EPL for temporary workers prompt a reallocation of innovation efforts towards the introduction of new products, away from process innovation aimed at cutting labor costs. Among innovative firms, the share of product innovators increases by 15% of the pre-reform value (10pp in absolute terms), while the share of firms specializing in process innovation falls by 35% (also 10pp).
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DOCTORAL STUDIES
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DISSERTATION: “Essays on the Political Economy of Development”

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PRIOR EDUCATION
Universidad de los Andes 2013
B.A. in Economics, *Summa cum laude*
B.A. in Philosophy, *Summa cum laude*

CITIZENSHIP
Colombian
GENDER: Male

LANGUAGES
English, French, Spanish

FIELDS
Primary Fields: Development Economics, Political Economy
Secondary Fields: Labor Economics

TEACHING EXPERIENCE
Introductory Mathematics (CEMFI, Masters) 2021
Instructor
Corruption and Development (CEMFI, PhD graduate)  
Instructor  
14.770 Introduction to Political Economy (MIT, PhD graduate)  
Teaching Assistant to Professors Daron Acemoglu and Ben Olken  
14.661 Labor Economics (MIT, PhD graduate)  
Teaching Assistant to Professors Daron Acemoglu and Joshua Angrist  
14.73 The Challenge of World Poverty (MIT, undergraduate)  
Teaching Assistant to Professors Esther Duflo, David Atkin and Frank Schilbach  
14.31/310 Data Analysis for Social Scientists (MIT, mixed undergraduate and graduate) Teaching Assistant to Professors Esther Duflo and David Atkin  
14.01 Principles of Microeconomics (MIT, undergraduate)  
Teaching Assistant to Professor Casey Rothchild

**RELEVANT POSITIONS**

- Postdoctoral Researcher, CEMFI, Madrid, Spain  
  2020-21
- Consultant for the Social Protection and Jobs Global Practice at the World Bank, remote work  
  2020-21
- Research Assistant to Daron Acemoglu (MIT), Cambridge, MA  
  2015-18
- Research Assistant to Ben Olken (MIT) and Melissa Dell (Harvard University), Cambridge, MA  
  2014-15
- Research Assistant to James A. Robinson (Chicago University), Bogotá, Colombia  
  2012-14

**FELLOWSHIPS, HONORS, AND AWARDS**

- Jameel Graduate Fellowship  
  2019
- J-Pal Governance Initiative Grant  
  2019
- George and Obie Shultz Fund Grant  
  2018-19
- Castle Krob Scholarship for doctoral studies  
  2014-16
- Ramón de Zubiría Scholarship for undergraduate studies  
  2010-13

**PROFESSIONAL ACTIVITIES**


Presentations and conferences:

2021: World Bank - Annual Bank Conference on Development Economics, Insistut d’Economia de Barcelona - Political Economy Workshop (Discussant), CEMFI.

2020: MIT, Inter-American Development Bank, EIEF, IE, Universidad de los Andes, Universidad del Rosario, Tecnológico de Monterrey.
RESEARCH PAPERS

“All Eyes on Them: A Field Experiment on Citizen Oversight and Electoral Integrity” (Job Market Paper) with Natalia Garbiras

- Revise and Submit requested from the *American Economic Review*

Can ICTs help citizens monitor their elections? We analyze a large-scale field experiment designed to answer this question in Colombia. We leveraged Facebook advertisements sent to over 4 million potential voters to encourage citizen reporting of irregularities, and varied whether candidates were informed about the campaign in a subset of municipalities. Total reports, as well as evidence-backed ones, experienced a large increase. Electoral irregularities, and in particular vote-buying, decreased. Finally, the reporting campaign decreased the vote share of candidates dependent on irregularities. We show that this light-touch intervention is substantially more cost-effective than monitoring efforts traditionally used by policymakers.

“State Capacity and Spillovers Across Enforcement Activities”

This paper provides evidence about enforcement spillovers across enforcement activities. In particular, it shows that public audits, aimed at detecting and sanctioning corruption by public servants, increase tax compliance in Brazil. As a source of identification, it uses the geographic and time variation induced by a large-scale random audit program conducted by Brazilian federal government on municipal governments throughout the 2003-2015 period. I begin by showing that municipalities receiving an audit in the past experience an increase in federal, but not municipal tax collection. I show evidence that these effects operate through a state capacity signaling channel, whereby audits and the subsequent penal actions, act as signals both of the capacity and the willingness of the federal government to enforce the law in general, which induces citizens to increase tax compliance. Consistent with this interpretation I show that local information about the audits, such as the one conveyed through local media or to neighboring municipalities, is key in determining the magnitude of these spillover effects across types of enforcement.

“How Close Is Too Close When It Comes to Public Auditing? Evidence from Colombian Municipalities”

Are more decentralized public auditing institutions better at increasing government accountability and reducing corruption than centralized ones? In this paper, I exploit the exogenous variation in the level of decentralization of local auditing institutions created by Colombian law to implement a regression discontinuity design and study the empirical effects of decentralizing public auditing. Using data from third-party investigations on corruption, I find that more centralized auditors do a better job at curbing corruption than decentralized ones. This result is driven by types of corruption related to public
procurement as well as ‘influence peddling’. Furthermore, I find that sanctions of public auditing institutions do not change with respect to whether these institutions are decentralized or not, which validates the use of the third-party investigations about corruption as a measure that does not confound the efforts of auditing institutions.

**RESEARCH IN PROGRESS**

**“Religious Leaders and Democratization” with Augustin Bergeron**

In this project we study the role of local leaders on democratization. We study this question in the context of Brazil’s dictatorship, where a number of pro-democratic bishops encouraged social movements that ultimately led to the transition to democracy. As a source of variation, we exploit quasi-random rules regarding the appointment of bishops, and show that bishoprics where pro-democratic bishops were appointed supported democratic parties in the transition to democracy. We are currently studying the longer-term effects on political opinions and participation.

**“Reproductive Health and Religion: Evidence from Italy”**

In 1968, Paul VI upended the Catholic Church’s ambiguous stance on contraceptives and assisted birth. Through the *Humanae Vitae* encyclical, the Church declared birth control contradictory with Christian values, and it lay the foundations of future positions of the clergy regarding reproductive and marital matters such as abortion, assisted births and divorce. In this project I study the consequences of these policies in the case of Italy. In particular, I use quasi-experimental variation in the appointment of bishops by Paul VI to study their influence in the 1974 Referendum about divorce, the 1981 Referendum about abortion and over fertility rates of the Italian population.
MATTHEW RIDLEY

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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2022
DISSERTATION: “Essays on the Economics of Mental Illness and Belief Formation”

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PRIOR EDUCATION
University of Oxford
MPhil, Economics
Distinction
2016

Cambridge University
BA, Economics
First-Class Honors
2014

CITIZENSHIP
United Kingdom

GENDER: Male

LANGUAGES
English (native); German (conversational)

FIELDS
Primary Fields: Development, Behavioral
Secondary Fields: Labor

TEACHING
Psychology and Economics (undergraduate, MIT course 14.13)
2020
EXPERIENCE

Teaching Assistant to Professor Frank Schilbach
Microeconomic Theory I (graduate, MIT course 14.122) 2019
Teaching Assistant to Professor Parag Pathak
Intermediate Microeconomics (undergraduate, MIT course 14.04) 2019
Teaching Assistant to Professor Robert Townsend
Labor Economics II (graduate, MIT course 14.662) 2019
Teaching Assistant to Profs. David Autor, Simon Jaeger
Microeconomic Theory I (graduate, MIT course 14.122) 2018
Teaching Assistant to Professor Parag Pathak
Applied Econometrics (graduate, MIT course 14.381) 2018
Teaching Assistant to Professor Kirill Evdokimov

RELEVANT POSITIONS

Research Assistant to Profs. Parag Pathak and Glenn Ellison 2017
Research Assistant to Profs. Parag Pathak and Joshua Angrist 2017

FELLOWSHIPS, HONORS, AND AWARDS

George and Obie Shultz Fund Grant 2021
George and Obie Shultz Fund Grant 2020
Weiss Fund Grant 2020
George and Obie Shultz Fund Grant 2019
Departmental Fellowship (Full Funding), MIT 2016-21
Best Academic Performance in first-year exams, Economics 2015
MPhil (Oxford)
Best Academic Performance in final exams, Economics 2014 (Cambridge)

PROFESSIONAL ACTIVITIES

Presentations:
TIBER Symposium, Tilburg University 2021
M-BEPS, Maastricht University 2021

PUBLICATIONS

“Poverty, Depression and Anxiety: Causal Evidence and Mechanisms”

RESEARCH PAPERS

“Mental Illness Discrimination” (Job Market Paper)
People with depression and anxiety often hide their condition at work, which is likely costly to themselves (if they forego treatment or support) and employers. Discrimination is a possible reason why, yet mental health discrimination has been relatively little explored by economists. Using an online experiment in which participants collaborate on a communication-based problem-solving task, I find that participants discriminate against depressed or anxious coworkers, paying more to avoid them than they do to work with the college-educated, and that these coworkers pay to hide their symptoms from others. A model of statistical discrimination based on earnings cannot explain these preferences:
depressed or anxious people are equally productive coworkers when exogenously assigned, and people hide their mental illness even absent financial consequences or the possibility of rejection. Instead, I find evidence that suggests participants avoid depressed or anxious coworkers because they expect to exert costly effort to help them if they do work together, and that participants hide symptoms from others out of a deeper norm of privacy about one's health.


We study social learning between spouses using an experiment in Chennai, India. We vary whether individuals discover information themselves or must instead learn what their spouse discovered via a discussion. Women treat their ‘own’ and their husband's information the same. In sharp contrast, men's beliefs respond less than half as much to information that was discovered by their wife. This is not due to a lack of communication: husbands put less weight on their wife's signals even when perfectly informed of them. In a second experiment, when paired with mixed- and same-gender strangers, both men and women heavily discount their teammate's information relative to their own. We conclude that people have a tendency to underweight others’ information relative to their own. The marital context creates a countervailing force for women, resulting in a gender difference in learning (only) in the household.

“Fiscal and Education Spillovers from Charter School Expansion” (with Camille Terrier). Revision requested, *Journal of Human Resources*.

Do charter schools drain resources and high-achieving peers from non-charter schools? We provide new evidence on the fiscal and educational consequences of charter expansion for non-charter students, using a 2011 reform that lifted caps on charter schools for under-performing districts in Massachusetts. We use complementary synthetic control (SC) and differences-in-differences instrumental variables (IV-DiD) estimators. Our results suggest greater charter attendance leaves per-pupil revenue unchanged but increases per-pupil expenditures, hence generating a fiscal stress on traditional public schools. Charter expansion also induces schools to shift expenditure from support services to instruction and salaries, and ultimately increases non-charter students’ achievement in math.

**RESEARCH IN PROGRESS**

“Discrimination and Employment of the Mentally Ill”.

How best can we reintegrate mental illness sufferers into the labor force, especially by reducing discrimination at work, and what are the economic benefits of doing so? I plan to hire depressed and anxious people and others from low-income communities in Chennai, India, to work together on simple manufacturing tasks in a randomized controlled trial. I will measure the effect of employment on mental health and the effects of an anti-stigma intervention on mental health, a theoretically-motivated measure of discrimination, and productivity. This work is on hold due to COVID-19.
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PRIOR EDUCATION
Princeton University 2016
A.B., Economics, with certificate in Applied and Computational Mathematics, Summa Cum Laude

CITIZENSHIP: USA
GENDER: Male

FIELDS
Primary Fields: Macroeconomics
Secondary Fields: Economic Growth, Innovation, Theory, Finance

TEACHING EXPERIENCE
14.06 Advanced Macroeconomics (Undergraduate) Spring 2020
Teaching Assistant to Professor George-Marios Angeletos

14.452 Economic Growth (Graduate) Fall 2019
Teaching Assistant to Professor Daron Acemoglu

14.06 Advanced Macroeconomics (Undergraduate) Spring 2019
Teaching Assistant to Professor George-Marios Angeletos
14.452 Economic Growth (Graduate)  Fall 2018
Teaching Assistant to Professor Daron Acemoglu

RELEVANT POSITIONS
Research Assistant to Professor George-Marios Angeletos  2017-2021

FELLOWSHIPS, HONORS, AND AWARDS
Gordon B. Pye Dissertation Fellowship, MIT  2020
Robert M. Solow Fellowship, MIT  2017
Halbert White ’72 Prize in Economics, Princeton University  2016

PROFESSIONAL ACTIVITIES
Presentations
2021: European Central Bank (Invited); ECB-FRBNY Conference on Expectations Surveys (Invited); Northwestern University; Econometric Society European Meeting; NBER Summer Institute, Economic Growth; NBER Summer Institute, Impulse and Propagation Mechanisms; Society for Economic Dynamics Annual Meeting (2020, rescheduled to 2021); American Economic Association Annual Meeting
2020: CESifo Conference on Macro, Money, and International Finance (Discussant); Econometric Society North America Winter Meeting

Refereeing

PUBLICATIONS


RESEARCH PAPERS
“Attention Cycles” (with Joel P. Flynn)
(Job Market Paper)

Using data from US public firms' regulatory filings and financial statements, we document that firms' attention to macroeconomic conditions is counter-cyclical and their propensity to make production mistakes is pro-cyclical. Attentive firms make smaller mistakes, and mistakes of the same size are punished more by financial markets during downturns. We explain these phenomena with a business cycle model in which firms, owned by risk-averse investors, rationally allocate costly attention across states. When aggregate productivity is low, there are higher rewards for delivering profits, and firms optimally pay more attention and make smaller mistakes. Endogenously counter-cyclical attention generates quantitatively significant asymmetric, state-dependent shock propagation and stochastic volatility of output growth.
“Does Directed Innovation Mitigate Climate Damage? Evidence from US Agriculture” (with Jacob Moscona)
(Revise and resubmit, Quarterly Journal of Economics)

This paper studies how innovation reacts to climate change and shapes its economic impacts, focusing on US agriculture. We show in a model that directed innovation can either mitigate or exacerbate climate change's economic damage depending on whether new technology is on average a substitute for or complement to favorable climatic conditions. To empirically investigate the technological response to climate change, we combine data on the geography of agricultural production, shifting temperature distributions, and crop-specific temperature tolerance to estimate crop-specific exposure to damaging extreme temperatures; we then use a database of crop-specific biotechnology releases and patent grants to measure technology development. We first find that innovation has re-directed toward crops with increasing extreme-temperature exposure and show that this effect is driven by types of agricultural technology most related to environmental adaptation. We next find that US counties' exposure to climate-induced innovation significantly dampens the local economic damage from extreme temperatures, and estimate that directed innovation has offset 20% of the agricultural sector's climate damage since 1960 and could offset 15% of projected damage in 2100. These findings highlight the vital importance, but incomplete effectiveness, of endogenous technological change as a systemic adaptive response to climate change.

“Inattentive Economies” (with George-Marios Angeletos)
(Revise and resubmit, Journal of Political Economy)

We study the efficiency of competitive markets when people are rationally inattentive. Appropriate amendments of the Welfare Theorems hold if attention costs satisfy an invariance condition, which amounts to free disposal of decision-irrelevant aspects of the state of nature. This condition is satisfied by the Shannon mutual information formulation of attention costs. More generally, inefficiency emerges and Hayek’s (1945) argument about the informational optimality of prices fails. Markets are the best means of allocating scarce attention when agents gain nothing from directly contemplating prices rather than the entire state of nature.

“Disagreement About Monetary Policy”

This paper studies the causes and consequences of belief differences between markets and central banks about monetary policy over the business cycle. Using US data since 1995, I document that “bad macroeconomic news” in public signals systematically predicts market over-estimation of interest rates, excessive market optimism about employment, and delayed correction of these forecasts. In a stylized model that can accommodate belief disagreements via three leading mechanisms—asymmetries between the market and central bank in their signals about fundamentals, beliefs about the monetary rule, and confidence in public signals—I show that significantly different confidence in public signals is necessary to explain the facts. The market's relative under-reaction to public signals substantially dampens the response of market beliefs to fundamentals, while the central bank's signaling through policy or the “information effect” has almost no role.

“Inappropriate Technology: Evidence from Global Agriculture”
(with Jacob Moscona)

An influential hypothesis explaining the persistence of global productivity differences is that frontier technologies are finely tuned to the local conditions of the high-income countries that develop them and inappropriate for application elsewhere. This paper studies how environmental differences between frontier innovators and the rest of the world shape the global diffusion, adoption, and productivity consequences of agricultural technology. Our empirical design uses differences in the presence of unique crop pests and pathogens (CPPs) as a instrument for the
appropriateness of crop-specific biotechnology developed in one country and applied in another. We first find that inappropriateness predicted by CPP differences reduces cross-country transfer of novel biotechnology. We next find that inappropriateness relative to frontier innovators reduces adoption of improved seeds and crop-level output. Our estimates suggest that the inappropriateness of the contemporary frontier reduces global productivity by 50% and increases cross-country dispersion in log productivity by 15% relative to a world in which technology were equally productive in all contexts. We use our framework to study how historical and predicted changes in the geography of innovation affect the global distribution of agricultural productivity.

“Screening with Under-Utilization: Tiers, Multi-Part Tariffs, and Welfare Implications” (with Roberto Corrao and Joel P. Flynn)

We study a screening model in which agents can under-utilize goods. We characterize implementable and optimal contracts and show that, whenever the principal values usage instrumentally, the optimal menu involves multi-part tariffs with tiers of zero marginal prices. We apply our results to study the pricing of digital goods which naturally feature usage-based revenue and unpunishable under-utilization, such as social media, news, and content streaming. We derive comparative statics that map the structure of usage-based revenues to familiar multi-part pricing schemes (premium plans, free trials, and free products) and study the welfare implications of technological progress in targeted advertising. We show how partial contractibility of usage generates an endogenous separation between “users” and “employees” of digital platforms.

“Strategic Mistakes” (with Joel P. Flynn)

To study the equilibrium implications of imperfect optimization, we introduce a model of costly control in continuum-player games in which agents interact via an aggregate of the actions of others. We find primitive conditions such that equilibria exist, are unique, are efficient, and feature monotone comparative statics for action distributions, aggregates, and the size of agents’ mistakes. We use our results to provide robust equilibrium predictions in a class of generalized beauty contests, which we apply to study the implications of imperfect optimization for financial speculation, price-setting, and the business cycle. We contrast our model with the mutual information model (Sims, 2003), which in the same games can produce non-unique predictions and non-monotone comparative statics.

RESEARCH IN PROGRESS

“How Much Can We Learn from Regional Data? The Factors That Complicate Inference” (with Jeremy Majerovitz)

“Screening on Attention” (with Roberto Corrao and Joel P. Flynn)
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PRIOR EDUCATION
University of Helsinki
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University of Toronto
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2014

CITIZENSHIP
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GENDER: Male

LANGUAGES
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FIELDS
Primary Fields: Labor Economics
Secondary Fields: Applied Microeconomics, Technology and Innovation
**TEACHING EXPERIENCE**

Labor Economics (graduate, MIT course 14.662) 2020

Teaching Assistant to Profs. David Autor and Arindrajit Dube

Introduction to Economics, TA (undergraduate, U of Helsinki) 2013; 12

**RELEVANT POSITIONS**

Research Assistant to Profs. Daron Acemoglu, David Autor, and John Van Reenen 2017–19

Researcher at ETLA Economic Research 2014–16

**FELLOWSHIPS, HONORS, AND AWARDS**

Harvard CES Dissertation Completion Fellowship 2021

“35 under 35” in Finland, Helsingin Sanomat 2021

Hausman Fellowship, MIT 2020

“35 under 35” in Finland, Kauppalehti 2019

“Future Makers of 2019,” YLE 2019

MIT Center for International Studies Grant 2019; 20

Kone Foundation Grant 2018

Labour Foundation Grant 2018; 19; 20

Stanley and Rhoda Fischer Fellowship, MIT 2017

Emil Aaltonen Foundation Grant 2017; 18; 20

Castle Krob International Fellowship, MIT 2017

Yrjö Jahnsson Foundation Grant 2016; 20

Fulbright Fellowship 2015

Award for the Best Economics Thesis, University of Helsinki 2015

Award for the Best Economics Student, University of Helsinki 2015

Award for the Best Thesis, U.S. Embassy in Finland 2015

**RESEARCH FUNDING**

OP Group Research Foundation ($54k) 2020; 21

Ministry of Economic Affairs and Employment ($21k) 2020

Yrjö Jahnsson Foundation ($22k) 2020

Foundation for Economic Education ($20k) 2020

George and Obie Shultz Fund ($17k) 2019; 20

ETLA Economic Research 2019–

(ongoing collaboration with a private research institute)

**PROFESSIONAL ACTIVITIES**


Organizer for: MIT Labor Discussion Group
**RESEARCH PAPERS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>“New Evidence on the Effect of Technology on Employment and Skill Demand” (Job Market Paper)</td>
<td>with Johannes Hirvonen and Aapo Stenhammar</td>
</tr>
</tbody>
</table>

We present new evidence on the effects of advanced technologies on employment, skill composition, and firm performance in manufacturing firms. Our primary research design focuses on a technology subsidy program in Finland that induced sharp increases in technology supply to specific firms. To address external validity, we also evaluate technology adoption events without the program. Our data track firms and workers over time and directly measure multiple technologies and skills. We demonstrate novel text analysis and machine learning methods to perform matching and to measure specific technological changes. The main finding is that advanced technologies led to increases in employment and no change in skill composition. To explain our finding, we outline a theoretical framework that contrasts two types of technological change: process versus product. We provide a wide range of evidence documenting that firms used new technologies to produce new types of output rather than replace workers with technologies within the same type of production. The results are in contrast with the idea that technologies necessarily replace workers or increase skill demand.

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Psychological Traits and Adaptation in the Labor Market”</td>
<td>with Ramin Izadi</td>
</tr>
</tbody>
</table>

Labor markets are in constant change. Which personality traits and skills help workers to deal with a changing environment? This paper documents how responses to labor-market shocks vary by individuals’ psychological traits. We construct measures of cognitive ability, extraversion, and conscientiousness using standardized personality and cognitive tests administered during military service to approximately 80% of Finnish men born 1962–1979. We analyze establishment closures and mass layoffs between 1995–2010 and document heterogeneous responses to the shock. Extraversion is the strongest predictor of adaptation: the negative effect of a mass layoff on earnings is about 20% smaller for those with one standard deviation higher scores of extraversion. Conscientiousness appears to have no differential impact conditional on other traits. Cognitive ability and education predict a significantly smaller initial drop in earnings but have no long-term advantage. Our findings appear to be driven directly by smaller dis-employment effects: extraverted and high cognitive-ability individuals find re-employment faster in a similar occupation and industry they worked in before. Extraversion’s adaptive value is robust to controlling for pre-shock education, occupation, and industry, which rules out selection into different careers as the driving mechanism. Extraverts are slightly more likely to retain employment in their current establishment during a mass layoff event, but the retention effect is not large enough to explain the smaller earnings drop.
“The Surprising Intergenerational Effects of Manufacturing Decline”

This paper analyzes the impact of manufacturing decline on children. To do so, it considers local employment structure—characterizing lost manufacturing jobs and left-behind places—high-school dropout rates, and college access in the US over 1990–2010. To establish a basis for causal inference, the paper uses variations in trade exposure from China, following its entry to the WTO, as an instrument for manufacturing decline in the US. While the literature on job loss has emphasized negative effects on children, the main conclusion of this research is that the rapid US manufacturing decline decreased high-school dropout rates and possibly increased college access. The magnitudes of the estimates suggest that for every 3-percentage-point decline in manufacturing as a share of total employment, the high-school dropout rate declined by 1 percentage point. The effects are largest in the areas with high racial and socioeconomic segregation and in those with larger African American populations. The results are consistent with the idea that the manufacturing decline increased returns and decreased opportunity costs of education, and with sociological accounts linking working-class environment and children’s education.

“School vs. Action-Oriented Personalities in the Labor Market”
(with Ramin Izadi)

How do different dimensions of personality predict school vs. labor-market performance? How has the value of these traits changed over time? We answer these questions using data that includes multidimensional personality and cognitive test scores from mandatory military conscription for approximately 80% of Finnish men. We document that some dimensions of noncognitive skills are productive at school, and some dimensions are counterproductive at school but still valued in the labor market. Action-oriented traits predict low school performance but high labor market performance. School-oriented traits, such as dutifulness, deliberation, and achievement striving, predict high school performance but are not independently valued in the labor market after controlling for school achievement. We further document that the labor-market premium to action-oriented personality traits has rapidly increased over the past two decades. To interpret the empirical results, we outline a model of multidimensional skill specialization. The model and evidence highlight two paths to labor-market success: one through school-oriented traits and formal skills, and one through action-oriented traits and informal skills.
RESEARCH IN PROGRESS

(with Jonas Mueller-Gastell)

Does shortage of labor or abundance of labor encourage technology adoption? Are machines and men substitutes so that labor scarcity induces investment in technology, or are they complements so that availability of workers facilitates technology adoption? The project uses local labor supply shocks in Finland at the verge of industrialization to study how technology and labor supply interact. These shocks come from two sources: combat deaths and evacuations from invaded areas into designated towns during the Second World War, 1939–45. The project uses newly digitized local and plant-level data on technology use by type, employment, and organization. We find a positive effect of labor abundance on manufacturing development. Evidence on horsepower per person shows that additional labor does not crowd out capital but complements capital investment. Manufacturing employment share and gross value-added per person increase substantially across all identification strategies, including strategies based on military and evacuation plans.

OTHER PROJECTS

ETLAnow: Unemployment forecasts using Google data:

Press coverage: The Washington Post, Bloomberg, Chicago Tribune, YLE
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Massachusetts Institute of Technology (MIT)
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DISSERTATION: “Essays in Behavioral and Development Economics”

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PRIOR EDUCATION
Ecole Polytechnique
BSc, Applied Mathematics
MSc, Economics and Finance (with HEC Paris)

CITIZENSHIP: France

LANGUAGE: French (native), English (fluent), basics of Spanish, German, Chinese

FIELDS
Primary Fields: Behavioral Economics, Development Economics
Secondary Fields: Political Economy, Applied Microeconomics, Micro Theory

TEACHING EXPERIENCE
14.160 Behavioral Economics (PhD) 2020
Teaching Assistant to Professors Frank Schilbach, Abhijit
Banerjee, and Dmitry Taubinsky
14.13 Psychology and Economics (Undergraduate) 2020
   Teaching Assistant to Professor Frank Schilbach
14.01 Principles of Microeconomics (Undergraduate) 2020
   Teaching Assistant to Professor Jon Gruber
14.137 Psychology and Economics (PhD) 2019
   Teaching Assistant to Professor Drazen Prelec
14.26 Economics of Incentives (Undergraduate) 2019
   Teaching Assistant to Bengt Holmstrom and Bob Gibbons
Topics in Modern Economics (Masters) 2016
   Teaching Assistant to Professor Jean Tirole

**RELEVANT POSITIONS**

Microsoft Research, Research Intern 2017, 2018
Research Assistant to Professor Jean Tirole 2016
Research Assistant to Professors Dan Benjamin, Ori Heffetz and Miles Kimball 2016

**RESEARCH GRANTS**

J-PAL Healthcare Delivery Initiative Pilot Grant (50k) 2021
J-PAL King Climate Action Initiative travel grant (10k) 2020
US Department of Health and Human Services, Administration for Children and Families, Behavioral Intervention Scholar (25k) 2020
Russell Sage Foundation Small Grant in Computational Social Sciences (10k) 2020
Harvard Foundations for Human Behavior (6k) 2020
MIT Shultz Fund Grants (40k) 2017-2021

Grants as co-PI with Professors:
IPA Peace and Recovery Program (50k)
Government of Colombia, Colciencias Grant (152k)
Warburg Funds Grant (17k)
Harvard Mind Brain Behavior Initiative (50k)
MIT SHASS Research Fund Award (9k)
Harvard Foundations for Human Behavior (40k)

**FELLOWSHIPS, HONORS, AND AWARDS**

MIT Economics Full Fellowship 2016-2022
Ecole Polytechnique Full Fellowship 2012-2015

**PROFESSIONAL ACTIVITIES**


PUBLICATIONS


“Effects of a large-scale social media advertising campaign on holiday travel and COVID-19 infections: a cluster randomized controlled trial,” *Nature Medicine, 2021.*

(with Carlos Torres, Lucy Oggu-Nwobodo, Marcella Alsan, Fatima Cody Stanford, Abhijit Banerjee, Emily Breza, Arun Chandrasekhar, Sarah Eichmeyer, Mohit Karnani, Tristan Loisel, Paul Goldsmith-Pinkham, Benjamin Olken, Erica Warner, and Esther Duflo)

“Comparison of Knowledge and Information-Seeking Behavior After General COVID-19 Public Health Messages and Messages Tailored for Black and Latinx Communities,” *Annals of Internal Medicine, 2020.*
(with Marcella Alsan, Fatima Cody Stanford, Abhijit Banerjee, Emily Breza, Arun G. Chandrasekhar, Sarah Eichmeyer, Paul Goldsmith-Pinkham, Lucy Oggu-Nwobodo, Benjamin A. Olken, Carlos Torres, Anirudh Sankar & Esther Duflo)

RESEARCH PAPERS

“When Managing Emotions: The Effects of Online Mindfulness Meditation on Mental Health and Economic Behavior” (Job Market Paper)
(with Advik Shreekumar)
In a four-week experiment with 2,384 US adults, offering free access to a popular mindfulness-meditation app has economic benefits: First, it increases earnings on a proofreading task by 2.5 percent. Second, recollection of personal worries significantly affects control participants' choices between incentivized lotteries, but access to the app mitigates this interference. We find no effect on information avoidance, small-probability loss aversion, or attention control. The app causes a 0.48 standard deviations reduction in symptoms of stress, anxiety and depression, comparable to the impacts of expensive in-person therapy, with improvements even among participants with minimal or mild symptoms initially. Overall, our results demonstrate the potential of affordable mindfulness
meditation apps to improve productivity, general mental health, and emotions regulation in ways that are consequential for economic behavior.

“The Long-Run Effects of Psychotherapy on Depression, Beliefs, and Preferences”
(with Bhargav Bhat, Jonathan de Quidt, Johannes Haushofer, Vikram Patel, Gautam Rao and Frank Schilbach)
We study the long-run effects of psychotherapy on mental health, self-confidence, economic preferences and employment. We revisit participants from two clinical trials in India that randomized depressed adults to a brief course of psychotherapy, costing only $66 per recipient and delivered by non-specialists, or to a control condition. Three to five years after treatment ended, we find significantly reduced depression scores, increased remission from depression, and improved mood in the treatment group. Motivated by hypotheses in psychology, we next examine the relationship between depression, self-confidence and belief updating. We find that therapy reduced overconfidence in a work task by causing individuals to update their beliefs more evenly in response to positive and negative feedback. It also led to increases in self-evaluations of prosociality and risk tolerance. We detect no significant impacts of treatment on patience, nor on employment or consumption.

RESEARCH IN PROGRESS

“The Role of Memory in Beliefs Formation”
(with Lukas Bolte, Markus Mobius and Tanya Rosenblat)
People constantly absorb information, aggregate this information into beliefs and then use these beliefs to make decisions. An extensive literature has studied learning frictions arising from failures to use Bayes rule, but little is known about the consequences of limited memory for beliefs formation. Using a simple model grounded in psychology research on memory, assuming that agents know Bayes rule but have limited memory, we show that the timing at which raw signals are processed into beliefs can lead to different patterns of errors. Beliefs can be updated in real time as soon as new information is received, or they can be formed ex-post by looking back at received information. We argue that both models are empirically relevant, depending on whether the decision problem is known in advance or not, and design an experiment to test the predictions of the model.

“Information Choice, Metacognition, and the Demand for Motivated Beliefs”
(with Spencer Kwon and William Murdock III)
Information avoidance and confirmation bias are well-documented phenomena often used as evidence that people derive intrinsic utility from holding certain beliefs. A Bayesian agent who holds non-linear utility over certain beliefs may indeed derive (second-order) utility improvements by avoiding resolving uncertainty. However, it is often implied that individuals might use information
decisions to generate or keep a bias in the first moment of their beliefs. This requires the agent to predict her own learning biases from a given information source, to select this information source and to somehow fail correcting for the (ex ante known) learning bias. We design an experiment to test the extent through which this mechanism may arise in practice. By manipulating individuals’ perceptions of their own biases following different information sources, we can test for a causal relationship from metacognition (the perception of one’s learning biases) to information source choice and final beliefs biases.

“Mindfulness at Work: A Randomized Controlled Trial of Mindfulness Meditation with Employees in a Large Colombian Organization”

On hold due to COVID-19.
DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD in Economics, expected completion June 2022

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PRIOR EDUCATION
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B.A. in Economics, Physics, and Math (minor), summa cum laude
2014

CITIZENSHIP
United States (naturalized)

GENDER:
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LANGUAGES
Chinese (fluent), French (elementary)

FIELDS
Primary Fields: Labor Economics, Personnel Economics
Secondary Fields: Organizational Economics, Industrial Organization

TEACHING EXPERIENCE
15.S57: Platform Strategy mini-course (Sloan Fellows MBA)
2021
Teaching Assistant to Professor Pierre Azoulay
Calculus I, II, and III; Introductory Physics
2011-12
Resident Peer Mentor, Park/Mudd Residential College
RELEVANT POSITIONS

Special Sworn Status, U.S. Census Bureau 2018-
Research Assistant to Profs. Daron Acemoglu and John Van Reenen (MIT) 2017-
Research Assistant to Prof. Parag Pathak (MIT) 2017-18
Research Assistant to Profs. John Beshears, James Choi, David Laibson, and Brigitte Madrian (NBER) 2014-16
Intern, Supervisory Policy and Risk Analysis (St. Louis Fed) 2013
Intern, Sales Forecasting and Price Analysis (AB InBev) 2012-13

FELLOWSHIPS, HONORS, AND AWARDS

Washington Center for Equitable Growth Doctoral Grant (with Samuel Young)
NSF Graduate Research Fellowship
Urban Institute Finance & Society Project (with John Beshears, James Choi, David Laibson, and Brigitte Madrian)
Phi Beta Kappa
Lock and Chain Honorary
Burton M. Wheeler Book Award

PROFESSIONAL ACTIVITIES

Referee: AER: Insights
Presentations: U.S. Census Bureau (2019)

PUBLICATIONS


RESEARCH PAPERS

“What Is the Price for Opportunity? The Effects of Employer Learning on Worker Promotions and Turnover” (Job Market Paper)
This paper identifies the causal effects of different firms on the career advancement of blue-collar workers and interprets these effects through the mechanism of employer learning. I use administrative data on the universe of Brazilian formal employment to study vertical promotions from production jobs to supervisory jobs, which constitute a key component of lifecycle wage growth for most young workers in Brazil. Using an array of research designs comparing workers around job-to-job transitions, I confirm that cross-sectional differences in firms’ promotion rates reflect systematic differences in firms’ causal effects, but I also find that the overall effects of high promotion firms on workers’ labor market outcomes are mixed. Workers who move to a firm in the top quartile of promotion rates rather than a firm in the bottom three quartiles are almost twice as likely to be promoted, but they are even more likely to leave formal employment altogether, and their average long-term wage gains are negligible. I explain these effects using a model where worker ability is initially unobserved.
and firms differ in their rate of learning about the abilities of employed workers. High learning firms improve the efficiency of matching between workers and jobs, but they also exacerbate the adverse selection of unemployed workers and increase occupational wage inequality. By calibrating the core predictions of the model to my treatment effects estimates, I show that skill misallocation remains substantial and that the implied degree of adverse selection among job movers can provide meaningful ex-post market power for employers.

“New Unionization, Establishment Exit, and Wages: Revisiting Evidence from U.S. NLRB Elections” (with Samuel Young)
(Results pending disclosure review by the U.S. Census).

“Firm Decentralization and Long-Run Growth” (with Daron Acemoglu, Scott Ohlmacher, and John Van Reenen)
The economic consequences of changing the power distribution within firms is a fundamental question in social science, yet little is known of its longer-run effects. We estimate the effect of delegating decision-rights from central headquarters to local plant managers on plant growth across a variety of countries by combining survey data on decentralization with administrative data on plant outcomes from the U.S. Census and Bureau van Dijk. To address causality, we develop a new “donor firm” methodology, exploiting the fact that there is long-run organizational persistence. (Results pending disclosure review by the U.S. Census).

“A Quasi-Experimental Approach to Identifying Labor Market Boundaries: Evidence from Brazilian Workers” (with Mayara Felix)
What constitutes a local labor market? We develop a general framework that allows the matching of workers to jobs to be frictional and depend arbitrarily on their geography, industry, occupation, and other firm characteristics. Furthermore, we consider the possibility that workers’ job transitions reflect both movements within labor markets as well as reallocation across labor markets. Within this framework, mobility patterns of workers based on all realized job transitions would overstate the size of the local labor market for workers. We empirically test for workers’ local labor market boundaries in Brazil using linked employer-employee data by following workers’ realized mobility choices after idiosyncratic firm layoffs. Preliminary evidence highlights that a substantial portion of workers’ job transitions reflects reallocation across local labor markets. Exogenously separated workers are half as likely to change occupations as opposed to changing municipalities or industries, whereas estimates based on all job transitions would have concluded the opposite. Our results highlight occupations as distinct from geography or firm characteristics, and particularly important for defining workers’ relevant outside options.

“Does Competition Matter for Public Schools?”
Academics and policymakers often emphasize the importance of competition between schools for improving student outcomes, but evidence on this channel has generally been mixed. I revisit the magnitude and effects of competition in
public schools using data on centralized assignment, student outcomes, and school expenditures from Denver Public Schools. First, I directly estimate the intensity of competition between traditional public schools, magnet schools, and charter schools. I find that the estimated competitive incentives for enrollment within Denver Public Schools are generally low, but can be substantial at some schools, especially in the charter and magnet sectors. I then use the rollout of centralized assignment to test for the effects of competition on school outcomes. I find that intra-district competition alone is unlikely to lead to substantial increases in school effectiveness, but it does shift schools’ discretionary spending towards instruction.
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PhD, Economics, Expected completion June 2022
Dissertation: “Essays in Applied Economics”

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Prior Education
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A.B, Magna Cum Laude with Highest Distinction in Physics
Minor in Computer Science

Citizenship
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Languages
Mandarin Chinese, Cantonese

Fields
Primary Fields: Labor Economics, Organizational Economics
Secondary Field: Monetary Economics

Teaching Experience
Intermediate Microeconomic Theory (MIT 14.04, undergrad) 2018-20
Teaching Assistant to Prof. Robert Townsend
Applied Economics for Managers (MIT 15.722, exec MBA), 2019
Teaching Assistant to Prof. Robert Gibbons
Organizational Economics (MIT 14.282, graduate), Teaching Assistant to Prof. Robert Gibbons 2018
Introduction to Computer Science II (Harvard CS51, undergrad) Teaching Assistant to Prof. Greg Morrisett 2011-12

RELEVANT POSITIONS
MIT Department of Economics, Research Assistant to Prof. David Autor and Parag Pathak 2016
University of Chicago Booth School of Business, Full-time Research Assistant to Prof. Matthew Gentzkow and Jesse Shapiro, Part-time Research Assistant to Prof. Eric Budish 2013-15
Applied Predictive Technologies, Business Consultant 2012-13

FELLOWSHIPS, HONORS, AND AWARDS
George and Obie Shultz Fund at MIT 2019
NSF Graduate Research Fellowship Program 2015
John Harvard Scholarship 2009
Detur Book prize 2009

PROFESSIONAL ACTIVITIES
Referee for: Journal of Economic Theory

RESEARCH PAPERS
“Labor Market Consequences of Domestic Outsourcing: Evidence from Legalization in Brazil” (Job Market Paper) with Mayara Felix
We leverage Brazil's unexpected legalization of outsourcing in 1993 to quantify the effects of domestic outsourcing on labor markets. We focus on security guards, the only major occupation to experience a large increase in outsourcing following legalization. First, we show that legalization led to a wave of occupational layoffs. Incumbent security guards affected by these layoffs moved to lower-wage firms and experienced persistent wage reductions. Second, we estimate the market-level effects of outsourcing legalization using a triple-difference specification that leverages regional variation in pre-legalization permissiveness of labor courts and compares security guards with less impacted occupations. We find that outsourcing legalization reallocated jobs from older to younger workers, increased total employment of guards by 8-15%, and raised their wages by 2-4%. Interpreted through an economic framework, our results imply that outsourcing legalization not only redistributed firm wage premia, as emphasized in recent literature, but it also generated substantial efficiency gains. If laid-off incumbent workers were fully compensated for their earnings losses, social breakeven would be achieved in one to five years.

I use comprehensive transactions data to investigate how digital currency issuance by a private online platform affected the exchange of used goods in a large North American barter community. Since the community forbade the use of cash, users initially relied on beer, gift cards, and transit tokens to overcome the lack of double coincidence. To reduce transaction difficulty, the community introduced an app-based digital token that could be
transferred among users and redeemed at designated local stores for retail goods. Token supply was then quintupled through helicopter drops to users. This increase in token issuance led transaction volume to persistently rise by 70%. However, when token redemption was suddenly halted at a subset of stores, a run on the token ensued and transaction volume fell.

“Ideological Bias and Trust in Information Sources” (with Matthew Gentzkow and Allen T. Zhang)
We study the role of endogenous trust in amplifying ideological bias. Agents in our model seek to learn a sequence of states using information from sources whose accuracy is ex ante uncertain. Agents rely on noisy feedback about the state from direct experience to learn the accuracy of sources. Small biases in this feedback can cause large ideological differences in the agents’ trust in information sources and their beliefs about the states, and may lead agents to become overconfident in their own judgment. Disagreements can be similar in magnitude whether agents see only ideologically aligned sources or see a diverse range of sources.

“Public Housing for Sale: Impact of the Tenants Purchase Scheme in Hong Kong”
I estimate the impact of Hong Kong’s Tenants Purchase Scheme (TPS), which allowed 183,700 households to buy their public rental housing units at discounted prices, using the program's staggered rollout across housing estates. I find that total population and average household size fell in treated estates, while average household income rose. These effects are not explained by reallocation of housing units across households, which was limited by resale and leasing restrictions. Rather, TPS relaxed household-size-contingent unit allocation and means-testing rules. It therefore incentivized some residents to move out and others to increase labor supply.

“The Careers of Outsourced Workers in Brazil” (with Duoxi Li)
We use Brazil's comprehensive administrative data to compare the careers, wages, and benefits of outsourced and direct-hire workers. We focus on security guards and cleaners, two service occupations for which contract firms are easily identifiable from industry codes. We find that contract-firm employment is associated with weakened long-term commitment, reduced internal development and promotion, and less rent sharing, with overall negative effects on the job security and career advancement of workers. The rent-reducing effects of outsourcing are substantially larger for the unlicensed occupation of cleaners than for the higher-wage occupation of security guards.

“Domestic Outsourcing and Firm Performance: Evidence from Brazil” (with Beatriz Pousada)
We quantify how domestic outsourcing affects firm performance by combining Brazil’s comprehensive employment data with firm surveys. We leverage several sources of exogenous variation, such as Brazil’s 1993 and 2017 outsourcing legalizations, as well as outsourcing events identified from
employment histories, to estimate the effects of outsourcing on firm productivity, profitability, and internal organization.
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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
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DISSERTATION: “Essays on Labor Market Institutions”

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PRIOR EDUCATION
Harvard University 2015
A.B. in Applied Mathematics Magna Cum Laude with Highest Honors

CITIZENSHIP  United States
GENDER  Male

FIELDS
Primary Fields: Labor Economics
Secondary Fields: Public Economics, Macro/Labor
RELEVANT POSITIONS

Student Coordinator MIT Application Assistance Program 2020-2021
U.S. Census Bureau: Special Sworn Status 2018-2021
Research Assistant to David Autor and Daron Acemoglu 2017-2020
Research Economist at Council of Economic Advisers 2015-2016
Intern at Citadel Global Fixed Income 2014
Intern at The Hamilton Project at Brookings 2013

FELLOWSHIPS, HONORS, AND AWARDS

George & Obie Schulz Fund Grant 2019
Washington Center for Equitable Growth Doctoral Grant 2019
NSF Graduate Research Fellowship 2016
Thomas T. Hoopes Senior Thesis Prize 2015

FUTURE TEACHING

14.03 Undergraduate Microeconomic Theory and Public Policy 2022
14.662 Graduate Labor Economics II 2022

CONFERENCES AND SEMINARS

U.S. Census Bureau 2021
CESifo - EconPol Europe Workshop, Equitable Growth 2021 2020
IAB Perspectives on (Un-) Employment, EEA Annual Meeting, Society of Labor Economists Annual Meeting 2019
IZA/CREST/OECD Conference on Labor Market Policy 2018


PUBLICATIONS

“Wages and the Value of Nonemployment” (with Simon Jäger, Benjamin Schoefer, and Josef Zweimüller) Quarterly Journal of Economics, 2020

Nonemployment is often posited as a worker’s outside option in wage-setting models such as bargaining and wage posting. The value of nonemployment is therefore a key determinant of wages. We measure the wage effect of changes in the value of nonemployment among initially employed workers. Our quasi-experimental variation in the value of nonemployment arises from four large reforms of unemployment insurance (UI) benefit levels in Austria. We document that wages are insensitive to UI benefit changes: point estimates imply a wage response of less than $0.01 per $1.00 UI benefit increase, and we can reject sensitivities larger than $0.03. The insensitivity holds even among workers with low wages and high predicted unemployment duration, and among job switchers hired out of unemployment. The insensitivity of wages to the nonemployment value presents a puzzle to the widely used Nash bargaining model, which predicts a sensitivity of $0.24–$0.48. Our evidence supports wage-setting models that insulate wages from the value of nonemployment.
“Unionization, Employer Opposition, and Establishment Closure”
(with Sean Wang) -- Job Market Paper
We study the effect of private-sector unionization on establishment employment and survival. Specifically, we analyze National Labor Relations Board (NLRB) union elections from 1981 to 2005 using administrative Census data on the universe of establishments in the U.S. Our research design combines difference-in-differences and regression discontinuity extrapolation methods to estimate treatment effects including elections that win by larger margins of support. We show that unionization decreases an establishment's employment and likelihood of survival. We hypothesize that two reasons for these effects are firms' ability to avoid dealing with new unions and managers' opposition to unions. We test this hypothesis for unionization in manufacturing, the largest sector where we find substantial negative effects. There, the negative effects are significantly larger for elections at multi-establishment firms, especially those with no other unionized establishments. We provide direct evidence suggesting that some of these differences are driven by multi-establishment firms shifting employment from newly unionized establishments to other establishments. Finally, we use the length of delays during the election process as a proxy for managers' opposition to the union and find substantially larger effects of successful elections with longer delays. Taken together, our results are consistent with firms' union avoidance tactics playing a role in explaining the overall negative effects of unionization.

“Noncompete Clauses, Job Mobility, and Job Quality: Evidence from a Low-Earner Noncompete Ban in Austria”
I study the effect of noncompete agreements on low-earning workers using a noncompete ban in Austria. The ban increased treated workers’ annual job-to-job transition rate by 0.3 percentage points (a two percent increase). This effect was driven by within-industry job transitions. The reform also disproportionately increased transitions to higher-quality firms and transitions accompanied by earnings gains. However, I do not find that the ban increased treated workers' overall earnings growth rates. This evidence shows that noncompetes in Austria restricted low-earning workers’ job mobility, but their impact was not large enough to affect overall mobility or earnings trends.