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<th>Name</th>
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</table>

P = Primary Field, S = Secondary Field
RODRIGO ADÃO
rradao@mit.edu

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Mr. Thomas Dattilo dattilo@mit.edu
617-324-5857

DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2016
DISSERTATION: “Essays in International Trade and Labor Markets”

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Cambridge, MA 02139
617-253-1927

Professor Dave Donaldson
ddonald@stanford.edu
Department of Economics, Stanford
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650-725-3995

PRIOR EDUCATION
M.A. in Economics, Pontifical Catholic University of Rio de Janeiro (PUC-Rio), 2011
B.A. in Economics, Pontifical Catholic University of Rio de Janeiro (PUC-Rio), 2007

CITIZENSHIP
Brazilian and Portuguese

GENDER
Male

LANGUAGES
English (fluent) and Portuguese (native)

FIELDS
Primary Field: International Economics
Secondary Fields: Labor Economics, Macroeconomics
### Teaching Experience

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<th>Course Code</th>
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<td>14.582</td>
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<td>Microeconomic Theory (Undergraduate, MIT)</td>
<td>Fall 2013</td>
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</table>

- Teaching Assistant to Professor Arnaud Costinot
- Teaching Assistant to Professors Iván Werning and Ariel Burstein
- Teaching Assistant to Professor Pol Antràs
- Teaching Assistant to Professors Arnaud Costinot and Dave Donaldson
- Teaching Assistant to Professors Arnaud Costinot, Dave Donaldson and Iván Werning
- Teaching Assistant to Professor Daniele Paserman
- Instructor of International Trade (Undergraduate, PUC-Rio) - Spring 2011

### Relevant Positions

<table>
<thead>
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<th>Position</th>
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<tr>
<td>Research Assistant to Professors Arnaud Costinot and Dave Donaldson</td>
<td>Summer 2014</td>
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<tr>
<td>Research Assistant to Professors Arnaud Costinot, Dave Donaldson and Iván Werning</td>
<td>Summer 2013</td>
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<tr>
<td>Research Assistant to Professors Arnaud Costinot and Andrés Rodríguez-Clare</td>
<td>Summer 2012</td>
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### Fellowships, Honors, and Awards

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<tr>
<td>FREIT-EIIT Award for Best Graduate Paper</td>
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<td>CIS Summer Study Grant</td>
<td>MIT, 2015</td>
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<tr>
<td>Graduate Fellowship</td>
<td>Department of Economics, MIT, 2011-2013</td>
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<tr>
<td>Kenan Sahin MIT Presidential Fellowship</td>
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<tr>
<td>FAPERJ Scholarship for the best graduate student in PUC-Rio</td>
<td>2010</td>
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<tr>
<td>Vinci Capital Fellowship for outstanding graduate students in Economics</td>
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<td>CAPES Scholarship for graduate students (PUC-Rio)</td>
<td>2009</td>
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<td>Accenture Outstanding Academic Achievement Award</td>
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<tr>
<td>Award for best undergraduate student in Economics (PUC-Rio)</td>
<td>2007</td>
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<tr>
<td>Excellence Scholarship for outstanding undergraduate students (PUC-Rio)</td>
<td>2004-2007</td>
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<tr>
<td>Second Place in National High-School Exam (Brazil, 1.9 million participants)</td>
<td>2003</td>
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### Professional Activities

- Presentation in EIIT conference 2015
This paper proposes a new approach to quantify the distributional effects of international trade. The starting point of my analysis is a Roy-like model where workers are heterogeneous in terms of their comparative and absolute advantage. In this environment, I show that the schedules of comparative and absolute advantage (i) determine changes in the average and the variance of the log-wage distribution and (ii) are nonparametrically identified from the cross-regional variation in the sectoral responses of employment and wages to observable sector-level demand shifters. I then use these theoretical results to quantify the distributional consequences of the recent movements in world commodity prices in Brazil. I find that shocks to world commodity prices account for 5-10% of the fall in Brazilian wage inequality between 1991 and 2010.

We develop a methodology to construct nonparametric counterfactual predictions, free of functional-form restrictions on preferences and technology, in neoclassical models of international trade. First, we establish the equivalence between such models and reduced exchange models in which countries directly exchange factor services. This equivalence implies that, for an arbitrary change in trade costs, counterfactual changes in the factor content of trade, factor prices, and welfare only depend on the shape of a reduced factor demand system. Second, we provide sufficient conditions under which estimates of this system can be recovered nonparametrically. Together, these results offer a strict generalization of the parametric approach used in so-called gravity models. Finally, we use China’s recent integration into the world economy to illustrate the feasibility and potential benefits of our approach.
# Jie Bai

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## Massachusetts Institute of Technology

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- Robert Townsend  
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  617-452-3722
- Nikhil Agarwal  
  agarwaln@mit.edu  
  617-324-6804
- Ms. Eva Konomi  
  evako@mit.edu  
  617-253-8787
- Mr. Thomas Dattilo  
  dattilo@mit.edu  
  617-324-5857

### DOCTORAL STUDIES

- Massachusetts Institute of Technology (MIT)  
- PhD, Economics, Expected completion June 2016  
- DISSERTATION: “Essays in Development Economics”

### Dissertation Committee and References

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  617-253-8855
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  617-452-3722
- Nikhil Agarwal  
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  77 Massachusetts Avenue, E17-224  
  Cambridge, MA 02139  
  617-324-6804

### Prior Education

- Yale University, 2007-2011
- B.A. in Economics and B.S. in Mathematics, *summa cum laude*

### Citizenship and Languages

- China  
  (native) and English (fluent)

### Fields

- Primary Fields: Development Economics  
- Secondary Fields: Industrial Organization
TEACHING EXPERIENCE
2016 14.272 Industrial Organization II (Graduate)  
Teaching Assistant for Prof. Michael Whinston
2016 14.03 Microeconomic Theory and Public Policy (Undergraduate/Graduate)  
Teaching Assistant for Prof. Nikhil Agarwal
2015 14.03 Microeconomic Theory and Public Policy (Undergraduate/Graduate)  
Teaching Assistant for Prof. Sari Pekkala Kerr
2015 14.01 Principles of Microeconomics (Undergraduate)  
Teaching Assistant for Prof. Jeffery Harris
2014 14.04 Intermediate Microeconomics Theory (Undergraduate)  
Teaching Assistant for Prof. Juuso Toikka
2014 14.121 Microeconomic Theory (Graduate)  
Teaching Assistant for Prof. Parag Pathak

RELEVANT POSITIONS
2013 Research Assistant for Prof. Esther Duflo and Prof. Tavneet Suri, MIT
2011 Research Assistant for Prof. Benjamin Olken, MIT
2010 Research Assistant at Innovations for Poverty Action, the Philippines
2009 Research Assistant for Prof. Christopher Udry, Yale University

FELLOWSHIPS, HONORS, AND AWARDS
2011- present MIT graduate fellowship
2014 Weiss Family Fund $37,000
2014 MIT George and Obie Shultz Fund $6,000
2014 J-PAL Discretionary Fund $20,000
2013 Jameel Fellowship, MIT
2011 Ida Green Fellowship, MIT
2011 Phi Beta Kappa, Junior year, Yale University
2011 Berkeley College Triffin Prize in Social Science, Yale University
2011 William M. Massee Prize for Excellence in Economics, Yale University
2010 Wendy E. Blanning Memorial Fellowship, Yale University

PROFESSIONAL ACTIVITIES
Referee for Journal of Public Economics
Conference presentation: NEUDC 2015

RESEARCH PAPERS
“Melons as Lemons: Asymmetric Information, Consumer learning and Seller Reputation” (Job Market Paper)
Abstract: A key problem in developing countries is the lack of high quality goods and services. I designed an experiment to understand this phenomenon in a setting that features typical market conditions in a developing country: the retail watermelon market in a major Chinese city. I begin by demonstrating empirically that there is substantial asymmetric information between sellers and buyers on sweetness, the key indicator of quality for watermelons, yet sellers do not sort and price watermelons by quality. I then randomly introduce one of two branding technologies into 40 out of 60 markets—-one sticker label that is widely used and highly counterfeited and one novel laser-cut label. I track sellers' quality, pricing and sales over an entire season and collect household panel purchasing data to examine the demand side's response. I find that laser branding induced sellers to provide higher quality and led to higher sales profits, establishing that reputational incentives are present and can be made to pay. However, after the intervention was withdrawn, all markets reverted back to baseline. To rationalize the experimental findings, I build an empirical model of
consumer learning and seller reputation. The structural estimates suggest that consumers are hesitant to upgrade their perception about the quality of the highly counterfeited brand, which makes reputation building a low return investment. While the new branding technology enhances consumer learning, the resulting increase in profits is not sufficient to cover the fixed cost of the technology for small individual sellers. Counterfactual analysis shows that information frictions and fragmented markets lead to significant under-provision of quality. Third-party interventions that subsidize initial reputation building for sellers could enhance welfare.

“The Impact of Local Trade Barriers on Export Activities, Firm Performance, and Resource Misallocation”

Abstract: It is well known that various forms of non-tariff barriers exist among Chinese provinces. Empirically, it is difficult to measure these barriers because they can take many forms. This research takes advantage of an export VAT rebate policy reform in 2004 as a natural experiment to identify the existence of internal trade barriers and study the impacts on TFP and resource allocation. In particular, as a result of shifting tax rebate burdens, the 2004 reform leads to a greater incentive for the provincial governments to block the domestic flow of non-local goods related to exporting. I find that foreign trade companies in the coastal region have become more “inward-looking” in the years after the reform, consistent with rising local trade barriers. The value of exports through intermediaries grows less in the inland region relative to the coastal region, and the negative effect is larger in inland provinces with greater exposure to the reform, measured using baseline reliance on trade through intermediaries. I extend the standard open-economy heterogeneous firm model by adding an intermediary sector as in Ahn, Khandelwal and Wei (2011), but with a new focus on the intermediary's role of domestic sourcing. The model can be used to perform general equilibrium analysis, examine firms’ entry and exit into exporting, and quantify the distortion on TFP.

“Separating the Income and Substitution Effects of Trade Liberalization on Schooling: Using Indian Tariff Reform as a Natural Experiment”

Abstract: This study uses 1991 Indian tariff reform as a natural experiment to examine the impacts of changes in returns to work on schooling. I propose an empirical strategy to separately identify the income and substitution effects. First, I use the 1999 IRIS-REDS Indian rural household survey data to identify crops that are the most and the least child labor intensive. After that, I construct shift-share measures (following Edmonds, Pavcnik and Topalova (2007)) for district average tariffs for the different crop categories with different child labor intensities. By exploiting the variations in pre-reform district crop compositions and tariff changes for different crops over time, I examine the differential impacts of tariff reductions for different crop categories on school attendance and child labor. I find that when adult labor-intensive crops lose trade protection, adult wage falls leading to a fall in child schooling. The negative income effect is bigger for girls. On the other hand, when child labor-intensive crops lose protection, the countervailing positive substitution effect as a result of falling opportunity cost of schooling outweighs the negative income effect for boys, but not for girls. Using a simple model adapted from the classic consumer demand
theory and the estimates of the regression coefficients, I perform a back-of-the-envelope calculation and find that the income and substitution elasticities are 0.23 and -1.18 respectively.


Abstract: This paper tests whether economic growth leads to lower corruption, using cross-industry variation in growth rates in Vietnam and survey data collected from over 13,000 Vietnamese firms between 2006 and 2010. We employ two instrumental variables strategies, one based on growth in a firm's industry in other provinces within Vietnam and a second based on industry growth in neighboring China. We find that growth causes a decrease in bribe extraction; the two IV strategies yield very similar estimates. We then model one mechanism that could generate such an effect. In our model, government officials' choice of how much bribe money to extract from firms is modulated by inter-jurisdictional competition. The model predicts that economic growth decreases the rate of bribe extraction under plausible assumptions, with the benefit to officials of demanding a given share of revenue as bribes outweighed by the increased risk that firms will move elsewhere. A second prediction is that the negative effect of growth on bribery is larger if firms are more mobile. We find empirical support for this prediction: there is a larger effect for firms whose property rights to their land are transferable and who have operations in multiple provinces, two proxies for geographic mobility. Our results suggest that as poor countries grow, corruption could subside on “its own,” particularly if firms have credible outside options.

“Understanding the Influence of Government Controlled Media: Evidence from Air Pollution in China” (with Mikhail Golosov, Nancy Qian, and Yan Kai)

Abstract: This project establishes several empirical facts to better understand the influence of government-controlled media in autocratic regimes. We document that government control and bias on the controversial topic of air pollution are salient; that individuals do not discount repeated information, even when they know the information comes from one biased government source; that individuals have difficulty interpreting conflicting pieces of information; and that the population is heterogeneous in the degree to which they update. These patterns are difficult to reconcile with Bayesian updating and frameworks that assume homogeneous populations.
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Mr. Thomas Dattilo dattilo@mit.edu
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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2016
DISSERTATION: “Essays on Information Choice”

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PRIOR EDUCATION
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M.Sc. *summa cum laude*, Economics and Social Sciences
2008

Bocconi University, Milan, Italy
B.A. *summa cum laude*, Economics and Social Sciences
2010

CITIZENSHIP
Italy

GENDER:
Male

LANGUAGES
English, Italian

FIELDS
Theory
### Teaching Experience

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<th>Course</th>
<th>Teaching Assistant to Professor</th>
<th>Semester</th>
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<tr>
<td>14.123 Microeconomic Theory III (Graduate)</td>
<td>Muhamet Yildiz</td>
<td>Spring 2015</td>
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<td>14.122 Microeconomic Theory II (Graduate)</td>
<td>Glenn Ellison</td>
<td>Fall 2013-14</td>
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<td>Spring 2014</td>
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</tbody>
</table>

### Fellowships, Honors, and Awards

- “Ando-Modigliani” fellowship for graduate studies 2011-12

### Professional Activities

- Referee for *Econometrica, Mathematical Social Sciences*

### Research Papers

- **“Games with Unrestricted Information Acquisition” (Job Market Paper)**
  
  When there is uncertainty about the state of fundamentals, the players' behavior depends not only on their information about the state, but also crucially on their information about each other's information. Before taking actions, what do the players choose to know about what the others know? In this paper, I propose a tractable model of information acquisition to address this question in a systematic way. To unmask the primitive incentives to acquire information, the model does not impose restrictions on the information choice technology: the players can acquire information not only about the state, but also about each other's information in a flexible way. In coordination games, I show that the players have a strong incentive to know what the others know, even if it is unrelated to the state. In investment games, this leads to risk-dominance as the unique solution. In linear-quadratic games, this generates nonfundamental volatility. I further show that this incentive weakens as the game gets large and players small. In large investment games, multiple equilibria arise where the players focus on information about the state. In linear-quadratic games, nonfundamental volatility vanishes if no player is central in the game.

- **“Rationally Inattentive Preferences and Subjective Attention Costs”**  
  (Joint with H. De Oliveira, M. Mihm, K. Ozbek)
  
  Paying attention to information is costly: it requires time, effort and cognitive resources. In this paper, we show how subjective costs of attention can be identified using observable choice data. By looking at a decision-maker’s willingness-to-pay for different opportunity sets - which require more or less information to make choices - we provide "canonical" properties of attention costs that are necessary and sufficient to identify a general model of rational inattention. We also provide an axiomatic characterization of rational inattention in this framework, and show how preferences reveal the amount of information the decision maker acquires.
“Endogenous Informational Smallness”
A player is informationally small if what she knows about the state can be learned by aggregating her opponents' information. In mechanism design, when all the players are informationally small, it is possible to overcome the incentive compatibility problem arising from the asymmetry of information and achieve Pareto efficiency. Informational smallness is often assumed in games with many players. In this paper, I study whether the players endogenously end up informationally small in large games with unrestricted information acquisition. I show that all the players are informationally small in equilibria that satisfy a mild symmetry condition.
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Prior Education
B.A. in Economics and Electrical Engineering summa cum laude 2009

Citizenship: Korea, Republic of
Gender: Male

Languages: English, Korean
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<th>FIELDS</th>
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<td>TEACHING EXPERIENCE</td>
<td>14.04 Intermediate Microeconomic Theory (Undergraduate) Fall 2015</td>
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<tr>
<td></td>
<td>Teaching assistant to Prof. Juuso Toikka</td>
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<tr>
<td></td>
<td>14.126 Game Theory (Graduate) Spring 2015</td>
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<td></td>
<td>Teaching assistant to Prof. Mihai Manea</td>
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<tr>
<td></td>
<td>14.273 Advanced Topics in Industrial Organization (Graduate) Spring 2013</td>
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<tr>
<td></td>
<td>Teaching assistant to Prof. Nikhil Agarwal</td>
</tr>
<tr>
<td></td>
<td>14.382 Econometrics (Graduate)</td>
</tr>
<tr>
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<td>Teaching assistant to Prof. Paulo Somaini</td>
</tr>
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</table>

| FELLOWSHIPS, HONORS, AND AWARDS | Samsung Scholarship 2010-2015 |
|                                  | Merit-based Scholarship, Seoul National University 2007 |
|                                  | College Scholarship, The Korea Foundation for Advanced Studies 2004-2008 |
|                                  | International Mathematical Olympiad, One of 12 Finalists of the Korean Team 2001 |

<table>
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<tr>
<th>RESEARCH PAPERS</th>
<th>“Procurement with a No Loss Constraint: Evidence and a New Mechanism from Korea” (Job Market Paper)</th>
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<td></td>
<td>Many construction procurers who use first price auctions eliminate abnormally low bids in order to reduce the probability of ex-post bid adjustment. The Korean government systematizes such a bid screening process by setting a stochastic cutoff under which bids are disregarded. This paper builds an auction model with ex-post bid adjustment and establishes that introducing a stochastic cutoff indeed decreases the probability of ex-post bid adjustment when the contractor is protected from ex-post loss. Data on Korean public procurement auctions for paving work is used to structurally estimate model parameters and assess welfare implications. Counterfactual analyses indicate that, if the Korean government were to switch to the usual first price auction, (1) the probability of bid adjustments triggered by cost overruns would significantly increase, from 14 percent to 88 percent; (2) the resulting social cost increase due to bid adjustment processes would amount to at least 360 percent of cost savings from the first price auction's ability to find an efficient firm; and therefore (3) the total social cost increase would be 7 percent. Finally, the paper employs a mechanism design approach to characterize an optimal mechanism under a no loss constraint and to provide a measure of efficiency loss associated with the two forms of auctions.</td>
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Most fast-food burger chains set different effective add-on (fries and a soda) prices in “meals” across burger items. This means that sophisticated consumers, who buy, for example, a sandwich-only and a meal, may try rearranging the add-ons across burgers in hopes of lowering their payment. This feature provides a unique opportunity to study consumers’ behavior, when a firm engages in price obfuscation – charging multiple prices for an identical product and requiring consumers to incur cognitive costs before finding lowest price quotes. Using sales data of a Korean local fast-food chain, this paper first presents descriptive evidence that consumers do respond to an opportunity to lower expenses by rearranging add-on items. Then it develops and estimates an optimal model of calculation and rearrangement where a consumer incurs a unit of cognitive cost for every effective add-on price of a burger she calculates.

“The Effect of Voluntary Costly Signaling Mechanism: Evidence from a Used Car Online Marketplace”
In 2014, a prominent conglomerate entered the Korean used car online market, which had been considered to suffer from information asymmetries. In order to alleviate the asymmetric information problem, the firm opened an online marketplace and offered costly information provision mechanism: it sold diagnosis services to interested sellers, whose cars on the website are then advertised as “diagnosed”. This paper investigates the effect of the costly signaling mechanism on prices and delays in sales.
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PRIOR EDUCATION
MSc Economics (Research Track) with High Distinction
B.A. in Economics with Highest Honors

London School of Economics, 2011
Universitat Pompeu Fabra, 2010.
CITIZENSHIP Spain

GENDER Male

LANGUAGES English (fluent), Spanish (native), Catalan (native), French (fluent), Italian (fluent).

FIELDS Primary Fields: Political Economy, Macroeconomics

Secondary Fields: Development, Economic History

TEACHING EXPERIENCE

International Trade (Undergraduate), MIT Teaching Assistant to Professor Arnaud Costinot Fall 2013

Principles of Microeconomics (Undergraduate), MIT Teaching Assistant to Professor Jeffrey Harris Spring 2014

RELEVANT POSITIONS

Research Assistant to MIT Professor Anna Mikusheva Summer 2012

Research Assistant to Institute for Economic Analysis, Higher Council for Scientific Research (CSIC) Professor Josep Maria Colomer 2009-2010

FELLOWSHIPS, HONORS, AND AWARDS

Banco de España Research Grant 2013-2015

La Caixa Foundation PhD Research Fellowship 2011-2013

LSE Scholarship, Caixa Catalunya-CIDOB 2010

High Distinction Recognition MSc Economics, LSE 2011

Best Academic Transcript Award, Col·legi d’Economistes de Catalunya 2010

PROFESSIONAL ACTIVITIES

Referee for Journal of Public Economics

RESEARCH PAPERS

“The Impact of Free Media on Regime Change: Evidence from Russia” (Job Market Paper)

Are free media a powerful tool to make regime change possible? Are Western countries successful in exporting their values to other countries and triggering regime change abroad? I study these questions in the
context of Russia in the early 90s when the Soviet Union was crumbling. In particular, I analyze the impact of Radio Liberty on the 1991 Russian presidential elections, which were the first democratic elections in the country. In order to study the effects of this American radio broadcasting from outside Russia, I use a novel empirical strategy exploiting ionospheric variation, which affects shortwave propagation over long distances, measured by NASA with the aim of obtaining a measure of radio availability in each Russian electoral district. The results show a significant effect of these broadcasts in favor of Yeltsin and a negative significant effect on communist support. Such results are robust and bolstered by a series of placebo exercises, and survey evidence. Thus, this paper documents that free media can play an important role in political processes of regime change.

**RESEARCH IN PROGRESS**

“Economic Divergence in Spain and the Persistent Effects of the Christian-Muslim Divide in the Middle Ages”

I analyze the persistent effects of the territorial division in Spain between the Christian kingdoms in the north and Islamic Iberia in the center and south of the country during the Middle Ages. I develop a novel institutional theory which predicts substantial positive effects of being originally on Christian soil. I analyze this question empirically by using a spatial donut discontinuity design which compares Christian and Muslim territories exploiting the dynamics of the reconquest process undertaken by the Christians which resulted in the Muslim defeat. Preliminary results show differences in current municipal economic development, which are consistent with the theory. These results could explain the well-documented North-South divide in Spain with a more developed north and a lagging south. I argue that these findings could be partially explained by demographic changes and the larger development of medieval cities in the northern territories.

“Balance of Power or the Power of the Masses? The Non-Monotonic Relationship between Democratization and Protests”

I provide empirical evidence that protests have a significant and non-linear impact on the likelihood that a country will successfully democratize. In particular, I find, using kernel methods, that it is for intermediate values of protests that the likelihood of democratization is higher. I then present a dynamic model to rationalize the empirical evidence. The framework is a three-agent model with hardliners, softliners, and the opposition. I show that regime change can only arise if softliners decide to align with the opposition. High levels of protests are counterproductive since they make
softliners support the autocratic regime in order to block regime change out of fear of being marginalized in a different regime. I finally perform a systematic econometric analysis to probe the robustness of the non-monotonic pattern found. I conclude that the non-monotonic relationship is indeed robust.
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DOCTORAL STUDIES
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DISSERTATION: “Essays on Housing, Poverty, and Public Health”

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PRIOR EDUCATION
Bocconi University, Italy
M.Sc. 110/100 cum laude in Economics and Social Sciences
2010

Bocconi University, Italy
B.A. 110/100 cum laude in Economics and Social Sciences
2008

CITIZENSHIP
Italian

GENDER: Female
LANGUAGES
English (fluent), Italian (native), German (fluent)

FIELDS
Primary Fields: Labor Economics, Real Estate Economics
Secondary Fields: Development Economics

TEACHING EXPERIENCE
JPAL Executive Education Course “Evaluating Social Programs”, Teaching Assistant, Summer 2013

RELEVANT POSITIONS
Research Assistant to Professor Eliana La Ferrara, Bocconi University, 2010
Research Assistant to Professor Roberto Perotti, Bocconi University, 2009

FELLOWSHIPS, HONORS, AND AWARDS
Bonaldo Stringher Fellowship, Bank of Italy, 2013-15
Giovanna Crivelli Fellowship, Unicredit Group, 2011-13
Roberto Franceschi Prize for outstanding research thesis, 2010
Merit Award Fellowship, Bocconi University, 2008-10

PROFESSIONAL ACTIVITIES
Referee: Econometrica.
Presentations: 2013; XVI European Conference, Fondazione Rodolfo De Benedetti

RESEARCH PAPERS
“The Price of a Safe Home: Lead Abatement Mandates and the Housing Market” (Job Market Paper)
State lead abatement mandates require owners of old houses to mitigate lead hazards in the presence of small children. I estimate the effects of these mandates on the housing market and child health using a triple differences strategy that exploits differences by state, year, and housing vintage. The estimates suggest a large fraction of the abatement costs fall on property owners, with house prices for multi-family properties declining by 6.4% and single-family homes declining 4.3%. These effects persist for at least a decade, consistent with low abatement rates. Families with small children bear part of the mandates' costs, too: after a mandate, these families are 17% less likely to live in old houses, and they pay higher rents for safer homes. Finally, suggestive evidence
indicates that the mandates lower the probability of lead poisoning by 25% per year, from an average of 1%. However, plausible estimates of the value of preventing lead poisoning indicate that, for families with small children, the higher housing expenditures exceed the expected value of the mandates’ benefits, which shows that analyzing the impact of these policies on the housing market is crucial for a comprehensive cost-benefit analysis.

**“Little Lead Soldiers: Lead Poisoning and Public Health”**

Lead poisoning has long-lasting consequences on children’s health, as well as on their cognitive and non-cognitive abilities. This paper exploits state-level policies to study the effects of mitigating lead-paint hazards on several public health outcomes in a difference-in-differences framework. While abatement mandates do not have any significant effect on fertility, birth outcomes, or infant mortality, these regulations reduce the incidence of lead poisoning. Lower blood lead levels, in turn, reduce the number of children requiring special education in exposed cohorts by 4.6%. Moreover, the improvements in educational outcomes appear to be concentrated among those students requiring special education, as average fourth-grade test scores are not significantly affected by the mandates.

**“Children or Canaries? Lead and Home Values”**

This project studies how the price and residents’ characteristics of leaded houses change when the units are inspected and, eventually, remediated for lead hazards. First, how does the value of a home change after a house is certified as lead-safe? Assessing the implied market valuation of a lead-safe home is crucial to inform the debate on prevention of lead poisoning. Second, how do buyers of certified and non-certified homes differ? The characteristics of households that select into riskier homes alter the direct effect of the toxin and are, therefore, relevant to design public health policies. To answer these questions, I plan to link address-level data on lead inspections and remediations from Maryland and Massachusetts to proprietary transaction data and to data on buyers’ characteristics collected under the Home Mortgage Disclosure Act. Restricting the sample to houses that are eventually inspected, I will compare prices and buyers’ characteristics of houses sold before and after they are certified. In addition, a subsequent merge with geocoded blood-lead level data from Massachusetts will allow me to focus on houses that are inspected and certified after an exogenous event, i.e., the lead poisoning of a previous resident.
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PRIOR EDUCATION
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BA with Distinction and Departmental Honors, Economics

CITIZENSHIP
United States

GENDER
Female

FIELDS
Primary Fields: Labor, Education
TEACHING EXPERIENCE

Labor Economics II (graduate, MIT)  
Teaching Assistant to Professors David Autor, Heidi Williams  
Spring 2013

Microeconomics III (undergraduate, Stanford)  
Teaching Assistant to Lecturer Mark Tendall  
Fall 2008 and Spring 2010

RELEVANT POSITIONS

Research Assistant to Professor Joshua Angrist (MIT)  
2011-2013

Research Assistant to Professor Heidi Williams (MIT)  
2011-2012

Research Assistant to Professor Grant Miller (Stanford)  
2008-2009

FELLOWSHIPS, HONORS, AND AWARDS

National Science Foundation Graduate Research Fellowship  
2010

Castle Krob Fellowship in Economics (MIT)  
2010

Firestone Medal for Excellence in Undergraduate Research (Stanford)  
2010

Phi Beta Kappa  
2010

PROFESSIONAL ACTIVITIES

Referee for Journal of Public Economics

PUBLICATIONS


RESEARCH PAPERS

“The Dynamic Effects of Teach for America in Hard-to-Staff Schools”  
(Job Market Paper)

Randomized evaluations show that Teach for America (TFA) teachers outperform colleagues in boosting achievement at hard-to-staff schools. Despite this cross-sectional evidence, TFA’s long-run effects remain unknown, a key concern for policymakers. High turnover among TFA recruits – who commit to serve for just two years – may undercut the long-run returns to hiring non-TFA teachers, who improve steeply with experience. To assess this potential tradeoff, I measure the short- and long-run effects of TFA hiring in North Carolina, where schools have employed TFA teachers since the program’s founding in 1990. I identify TFA hiring effects by exploiting quasi-random variation in teacher hiring shocks across grades within schools. In the short run, TFA rookies increase math scores markedly relative to the non-TFA teachers schools might otherwise hire; TFA’s initial advantage in reading is modest. When schools replace exiting TFA teachers with new TFA recruits, these gains more than offset the costs of lost experience, increasing long-run achievement. On the other hand, when TFA supply fluctuates, schools may have to replace exiting TFA teachers with inexperienced and lower-performing non-TFA hires. On net, short-run gains from one-shot TFA hiring exceed the costs.
Does financial aid increase college attendance and completion? Selection bias and the high implicit tax rates imposed by overlapping aid programs make it hard to tell. This paper reports initial findings from a randomized evaluation of a large privately-funded scholarship program for applicants to Nebraska’s public colleges and universities. Our research design answers the challenges of aid evaluation with random assignment of aid offers and a strong first stage for aid received: randomly assigned offers increased aid markedly. This, in turn, appears to have boosted enrollment and persistence, while shifting many applicants from two- to four-year schools. Awards offered to nonwhite applicants and to those with relatively low academic achievement generated the largest gains in enrollment and persistence, while effects were much smaller for applicants predicted to have stronger post-secondary outcomes in the absence of treatment. Thus, awards enabled groups with historically-low college attendance to ‘level up,’ largely equalizing enrollment and persistence rates with traditionally college-bound peers, particularly at four-year programs. Awards offered to prospective community college students had little effect on college enrollment or the type of college attended.

Many public school districts employ a bimodal mix of young and old teachers, with high burnout rates among novices and legions of baby boomers nearing retirement. I study one state’s attempt to recruit more teachers by reducing a common barrier to entry for mid-career workers: the experience penalty. Teacher salary schedules typically dictate that first-time teachers receive entry-level wages regardless of their work history in other occupations. In 1999, North Carolina became the first and only state to compensate teachers for prior experience in non-teaching positions. I show that this reform eliminated the gap between teaching salaries and median wages outside teaching for women and racial minorities, which I estimate brought more than 5,000 new teachers to the state. New recruits primarily served hard-to-staff schools and subjects, especially high school math and science. In ongoing work, I study the effect of the reform-induced supply shock on student achievement.
“Interpreting Instrumented Difference-in-Differences” (with Peter Hull and C. Jack Liebersohn)

Scaling a difference-in-differences effect on an outcome by a difference-in-differences effect on a mediating treatment is a longstanding and increasingly common practice in applied microeconomics. When treatment effects are constant within a population, instrumented differences-in-differences (DD-IV) identifies the population average treatment effect. When effects vary across individuals, however, DD-IV may generate misleading results: treatment effects may be positive for everyone and yet DD-IV delivers negative estimates. We propose intuitive assumptions under which DD-IV identifies a convex average of heterogeneous causal effects in both panels and repeated cross-sections. We discuss common applications and highlight conditions in which the DD-IV identifying assumptions fail.
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DOCTORAL STUDIES

Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion January 2016
DISSERTATION: “Strategic Behavior in Pension Markets”

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**PRIOR EDUCATION**

<table>
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<tr>
<th>Degree</th>
<th>Institution</th>
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<tbody>
<tr>
<td>M.A. Economics</td>
<td>Pontificia Universidad Católica de Chile</td>
<td>2009</td>
</tr>
<tr>
<td>B.A. Business and Economics</td>
<td>Pontificia Universidad Católica de Chile</td>
<td>2009</td>
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**CITIZENSHIP**

<table>
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<td>Chile</td>
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**GENDER**

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**LANGUAGES**

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**FIELDS**

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<td>Industrial Organization, Econometrics</td>
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**TEACHING EXPERIENCE**

<table>
<thead>
<tr>
<th>Course/Program</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Organization and Competitive Strategy (MIT, Undergraduate) Lecturer</td>
<td>MIT</td>
<td>Spring 2016</td>
</tr>
<tr>
<td>Industrial Organization II (MIT, Graduate) Teaching Assistant for Professor Michael Whinston</td>
<td>MIT</td>
<td>Spring 2015</td>
</tr>
<tr>
<td>Economics of E-Commerce (MIT, Undergraduate) Teaching Assistant for Professor Sara Ellison</td>
<td>MIT</td>
<td>Fall 2014</td>
</tr>
<tr>
<td>Research and Communication in Economics (MIT, Undergraduate) Teaching Assistant for Professor Sara Ellison</td>
<td>MIT</td>
<td>Fall 2013</td>
</tr>
<tr>
<td>Industrial Organization and Competitive Strategy (MIT, Undergraduate) Teaching Assistant for Professor Nancy Rose</td>
<td>MIT</td>
<td>Spring 2012</td>
</tr>
<tr>
<td>Intermediate Microeconomic Theory (MIT, Undergraduate) Teaching Assistant for Professor Jawwad Noor</td>
<td>MIT</td>
<td>Fall 2012</td>
</tr>
<tr>
<td>Introductory Economics (Pontificia Universidad Católica de Chile, Undergraduate) Lecturer</td>
<td>Pontificia Universidad Católica de Chile</td>
<td>Spring 2009 to Spring 2010</td>
</tr>
</tbody>
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**RELEVANT POSITIONS**

<table>
<thead>
<tr>
<th>Position</th>
<th>Year</th>
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<tbody>
<tr>
<td>Research Assistant for Professor Joshua Angrist</td>
<td>2011</td>
</tr>
<tr>
<td>Research Assistant for Professor Panle Jia Barwick</td>
<td>2011</td>
</tr>
</tbody>
</table>

**FELLOWSHIPS, HONORS, AND AWARDS**

<table>
<thead>
<tr>
<th>Fellowship/Grant</th>
<th>Year(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Fellowship from the Lynde and Harry Bradley Foundation</td>
<td>2014 and 2015</td>
</tr>
<tr>
<td>George P. and Obie B. Shultz Dissertation Grant</td>
<td>2012 and 2015</td>
</tr>
<tr>
<td>Conicyt-Chile Ph.D. Fellowship</td>
<td>2010</td>
</tr>
<tr>
<td>Award for Best Graduate of M.A. in Economics</td>
<td>2009. Pontificia Universidad Católica de Chile</td>
</tr>
<tr>
<td>Raúl Yver O. Award to the Best Graduate in Business and Economics</td>
<td></td>
</tr>
</tbody>
</table>
Concentration Economics, 2009. Pontificia Universidad Católica de Chile

“Switching Costs in Pension Plan Choice” (Job Market Paper)
How well do market mechanisms for retirement savings function when there are switching costs? This work answers this question by estimating a dynamic demand model with switching costs for pension fund administrator choice in Chile’s privatized pension market. This market exhibits significant price dispersion and very low switching rates, and switching costs are often mentioned as a likely driver of this outcome. If this is the case, then regulatory intervention to lower switching costs may increase welfare. This is not only important for the functioning of the Chilean pension market, but also more generally for other settings where governments mandate consumer participation and set the default as continuing in the same firm as last period. A key challenge in dynamic demand models is the fact that consumers form expectations about the future evolution of product characteristics and base their choices on them. Using a new methodology, based on a combination of revealed preference inequalities and latent variable integration, this work takes these expectations into account without having to model them explicitly, while using exclusion restrictions to separate switching costs from unobserved preference heterogeneity. I find evidence for a lower bound on switching costs of $1,400 dollars, a number significantly higher than that found in previous work. Furthermore, I find evidence that consumers over-value returns differences across pension fund administrators relative to price differences. Observed prices are, on average, roughly twice as high as in a no switching cost counterfactual, suggesting that policy interventions to lower switching costs would be beneficial.

“Estimating the Effect of Potential Entry on Market Outcomes Using a Licensure Threshold” (joint with Sarah Moshary)
We study the effects of potential entry on market outcomes in the context of Washington state’s 2012 switch from a state-run monopoly to private liquor sale. Concern about alcohol-related crime prompted regulators to institute a 10,000 square foot licensure requirement to curtail entry. This store size threshold generates plausibly exogenous variation in the number of eligible entrants in local liquor markets across the state. We find that widening the pool of potential entrants has a small effect on pricing, but a significant effect on product offerings. In particular, markets with more potential entrants see a compositional shift in product offerings towards cheaper goods. Further, we find that the size requirement changes the composition of entrant size, rather than the aggregate number of entrants.
Government-run exchanges, public platforms where private firms and consumers trade, are gaining popularity to improve the efficiency of insurance markets. We focus on the platform for purchasing annuities for retirees in the Chilean privatized pension system. Voluntary annuitization of retirement wealth is very common, with more than 60% of retirees purchasing a private annuity through the exchange. In contrast, less than 5% of US retirees purchase annuities, despite theoretical predictions that annuitization should be higher. Using a novel individual-level dataset, we provide new evidence that consumers select based on private information into differentiated intermediaries, firms, and contract types, in addition to adverse selection into annuities as a whole. We set up a structural life-cycle model of consumer demand for annuities to study the welfare implications of firm differentiation, competition and endogenous selection of unobservable types into retirement products. This model allows us to simulate counterfactuals where the alternative to annuitization is analogous to the US, and propose three reasons that may be driving Chilean retirees to annuitize at a higher rate than US retirees: 1) the design of the government-mandated "outside option" to annuitization, 2) lower markups, and 3) firms’ ability to price on many consumer characteristics, leading to lower levels of adverse selection.
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Doctoral Studies
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2016
Dissertation: “The Economics of Pain Management”

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Prior Education
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S.B. in Economics, S.B. in Political Science

Citizenship
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Gender: Female
FIELDS
Primary Fields: Health Economics, Public Finance
Secondary Fields: Development Economics

TEACHING EXPERIENCE
14.01 Principles of Microeconomics (Undergraduate) Teaching Assistant to Professor Jonathan Gruber, MIT Fall 2013
14.01 Principles of Microeconomics (Undergraduate) Teaching Assistant to Professor Jeffrey Harris, MIT Spring 2014

RELEVANT POSITIONS
Research Assistant to Ben Olken and Rema Hanna, Jameel Poverty Action Lab and World Bank Indonesia 2008-2009
Luce Scholar (Indonesia) and Researcher, Akatiga Foundation 2007-2008
Research Assistant to Ben Olken, Jameel Poverty Action Lab 2006-2007

FELLOWSHIPS, HONORS, AND AWARDS
NBER Health and Aging Pre-Doctoral Fellowship 2015-2016
National Science Foundation Graduate Research Fellowship 2011-2016
Graduate Student Council Service Award 2013
Henry Luce Scholar 2007-2008
Lemelson-MIT prize, IDEAS Competition 2007
Political Science department Outstanding Thesis Award 2007
Sigma Xi 2007
“Opioids for the masses: Welfare tradeoffs in the regulation of narcotic pain medications” (Job Market Paper)

Use of prescription opioid pain relievers to manage pain has increased fourfold since 1999, as medical guidelines have increasingly emphasized that appropriate pain management is required for an acceptable standard of care. However, a concomitant rapid rise in opioid abuse, addiction, overdose, and death has led to recent efforts to crack down on opioid prescribing. This paper sheds light on the tradeoffs of public policies that reduce the supply of medical opioids by investigating their health, labor, and welfare ramifications. I exploit state-level variation in the introduction of Prescription Monitoring Program (PMP) laws, and make use of several rich data sources, documenting that PMPs reduce the distribution of opioids, and achieve a key policy goal by reducing opioid overdose deaths by about 12%. I also find substantial costs resulting from these policies, including increased pain in the hospital setting, more missed days for injured and disabled individuals, and substitution towards more expensive medical care. A rough back-of-the-envelope welfare calculation suggests the welfare losses and gains from regulation are on the same order of magnitude - approximately $12.1 billion per year in increased costs from inpatient and outpatient medical spending plus lost wages, compared to $7.3 billion per year in benefits from lives saved from opioid and heroin overdose.

“Understanding recent expansion in the demand for heroin”

Heroin overdose deaths have increased by 40% yearly since 2010, increasing from 3,048 in 2010 to 8,291 in 2013, the most recent year data are available. I investigate the determinants of this marked expansion in heroin overdose death, focusing on two potential explanations. First, I examine substitution by users between prescription opioid pain relievers and heroin. I study the effect of county-level illicit opioid availability, exploiting variation from state-level prescription crackdowns, and using a county border strategy that tests for cross-state spillovers from crackdowns in neighboring states. Second, I examine the role of lower heroin prices in heroin demand. I exploit variation in drug trafficking networks from south of the border through the United States, where east coast white powder is usually supplied by Colombia, and west coast black tar is typically supplied by Mexico, and utilize intertemporal differences in interdiction efforts in Colombia and Mexico. I find evidence that heroin is a short-run substitute and long-run complement for prescription opioids, and that opioids prescribed through the medical care system have therefore played an important role in driving the current expansion in heroin use. Research on the role of lower heroin prices in increased demand is ongoing.
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2016
DISSERTATION: “A model of optimal consumer search and price discrimination in the airline industry”

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PRIOR EDUCATION

University of California Berkeley
B.A. Highest honors in Economics and Applied Mathematics, 2010
Primary Field: Industrial Organization

Economic Applications of Game Theory (Undergraduate), Teaching assistant for Prof. Muhamet Yildiz (Fall 2012)
Industrial Organization and Competitive Strategy (Undergraduate), Teaching assistant for Prof. Nancy Rose (Spring 2013 and Spring 2014)
Microeconomic Theory and Public Policy (Undergraduate), Teaching assistant for Prof. Daniele Paserman (Fall 2013) and Prof. David Autor (Fall 2014)
Economics of Incentives (Undergraduate), Teaching assistant for Prof. Heikki Rantakari and Prof. Bengt Holmstrom (Fall 2013 and Fall 2014)
Strategy and Information (Undergraduate), Teaching assistant for Prof. Mihai Manea (Spring 2015)
Principles of Microeconomics (Undergraduate), Teaching assistant for Prof. Jonathan Gruber (Fall 2015)
Statistical Methods in Economics (Graduate), Teaching assistant for Prof. Matt Masten (Fall 2015)

“A model of optimal consumer search and price discrimination in the airline industry” (Job Market Paper)
The welfare effects of price discrimination in the market for airfare can be ambiguous: price discrimination can increase airline revenue, but it can also allow for a more efficient allocation of tickets. This paper examines the market for airfare with a structural model of consumer search. My model features sophisticated consumers with rational beliefs about future price movements. Consumers in the market make optimal decisions based on their beliefs about future prices, search costs, and their probability of flying. I model beliefs about future prices as a Markov process based on flight characteristics and current prices. Using data on daily price and quantity in monopoly markets, I estimate the demand for airfare and calculate consumer welfare. I find that leisure travelers account for 60% of all air travel and are more prone to searching for tickets, an average of 2.48 times compared to 1.03 times for business travelers. I compare welfare in a counterfactual market in which airlines cannot price discriminate. The results show that without price discrimination, 5.13% fewer tickets are sold, and consumer welfare increases as a result of lower prices, fewer sales and less ticket changing fees.
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PRIOR EDUCATION
BA in Economics and Mathematics, Williams College 2009

CITIZENSHIP
USA

GENDER: Male

FIELDS
Primary Fields: Energy and Environment, Public Finance
Secondary Fields: Industrial Organization
<table>
<thead>
<tr>
<th>Teaching Experience</th>
<th>MIT Public Finance and Public Policy, Undergraduate</th>
<th>Fall 2013</th>
</tr>
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<tr>
<td></td>
<td>Teaching Assistant to Professor Jonathan Gruber</td>
<td>2010-2011, 2013</td>
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<tr>
<td></td>
<td>J-PAL Executive Education Course</td>
<td>2008-2009</td>
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<tr>
<td></td>
<td>Teaching Assistant to Professors Kenneth Kuttner and Lara Shore-Sheppard.</td>
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<tr>
<td></td>
<td>Williams College Introductory Statistics, Undergraduate</td>
<td>2007</td>
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<tr>
<td></td>
<td>Teaching Assistant to Professor Bernhard Klingenberg</td>
<td></td>
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<tr>
<td>Relevant Positions</td>
<td>Research Assistant to Michael Greenstone, MIT</td>
<td>2013-2014</td>
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<td></td>
<td>Research Analyst, Abdul Latif Jameel Poverty Action Lab</td>
<td>2009-2012</td>
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<tr>
<td>Fellowships, Honors, and Awards</td>
<td>National Science Foundation Graduate Research Fellowship</td>
<td>2011-2016</td>
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<td></td>
<td>Total-MIT Energy Fellow</td>
<td>2014-2015</td>
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<td></td>
<td>Phi Beta Kappa</td>
<td>2009</td>
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<td></td>
<td>William W. Kleinhandler Prize for Excellence in Music</td>
<td>2009</td>
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<tr>
<td>Professional Activities</td>
<td>Referee for Journal of the Association of Environmental and Resource Economists</td>
<td></td>
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<tr>
<td>Research Papers</td>
<td>“Learning by Doing and Spillovers in Renewable Generation: Evidence From US Wind and Solar Farms” (Job Market Paper)</td>
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<td>Learning by doing is often cited as a rationale for subsidizing renewable electricity, but there is relatively little project-level evidence on how knowledge is accrued. Using detailed atmospheric data to account for potential output, we study whether generation and installation experience lead to increased productivity for solar and wind projects. We further assess the appropriability of experience by considering the transfer of knowledge within and across firms. Generation experience on a particular project leads to higher productivity at that project but not at other sites. Installation experience leads to higher output on subsequent projects, and exhibits spillovers across owners with proximate installation sites for wind farms. This is consistent with other work suggesting that renewable project developers benefit from accrued knowledge.</td>
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<tr>
<td>Research In Progress</td>
<td>“The Impact of Renewable Energy on Electricity Markets: Evidence From State Renewable Portfolio Standards” (with Michael Greenstone)</td>
<td></td>
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<td>Renewable Portfolio Standards are one of the largest policies promoting clean energy in the US. Despite their prevalence and scope, the cost-effectiveness of these policies is currently poorly understood. Using panel data on program characteristics, electricity prices, generation, and employment, we examine the impact of these policies. Portfolio standards have been successful at increasing regional renewable generation, with marginal compliance coming almost entirely from wind energy. However, costs to consumers are large, with retail electricity rates increasing by 9-15% five years after adoption. Based on our estimates, the cost of carbon abatement from these programs is substantial, and well above conventional estimates of the social cost.</td>
<td></td>
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DISSERTATION: “Essays on Financial Frictions and the Macroeconomy”

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PRIOR EDUCATION
London School of Economics, MSc Econometrics and Math. Econ. 2011
Indian Institute of Technology Bombay, BTech Computer Science 2009

CITIZENSHIP
Indian

GENDER: Male

LANGUAGES
English, Marathi, Hindi

FIELDS
Primary Fields: Macroeconomics and Finance
Secondary Fields: International Economics
**TEACHING EXPERIENCE**

International Economics (Macro. & Fin.) (PhD, MIT course 14.582) 2016
Teaching Assistant to Arnaud Costinot and Emi Nakamura

Intermediate Macroeconomics (undergraduate, MIT course 14.05) 2016
Teaching Assistant to Alp Simsek

Principles of Macroeconomics (undergraduate, MIT course 14.02) 2015
Teaching Assistant to James Poterba

Principles of Macroeconomics (undergraduate, MIT course 14.02) 2014
Teaching Assistant to Francesco Giavazzi

Economic Growth (PhD, MIT course 14.452) 2013
Teaching Assistant to Daron Acemoglu

**RELEVANT POSITIONS**

PhD Intern, Federal Reserve Bank of New York 2015
*Project: Rehypothecation and monetary policy*

Quantitative Analyst, QFR Capital Management, New York 2012
*Project: Global macro strategy using S&P volatility*

Research Assistant to Professor Ivan Werning, MIT 2012
*Project: Monetary policy in a liquidity trap*

Research Assistant to Professor Erik Eyster, LSE 2011
*Project: Behavioral correlation neglect by financial investors*

Research Intern, INRIA Sophia-Antipolis, France 2008
*Project: Segmentation of holotomographic images using MCMC*

Research Intern, ETH Zurich, Switzerland 2007
*Project: Complexity of the Travelling Salesman Problem in 2-D*

**FELLOWSHIPS, HONOURS, AND AWARDS**

Ely Devons Prize for Top Performance, LSE 2011
Inlaks Scholarship 2009-11

**RESEARCH PAPERS**

Collateral Reuse in Shadow Banking and Monetary Policy (Job Market Paper)

Abstract—in the shadow banking system, rehypothecation and securitisation (pyramiding) are two ways in which collateral is reused by the lender. With securitisation, the value of the repledgeable collateral, and hence the amount that can be borrowed, is limited by the face value of the original debt contract. Rehypothecation of the collateral enables borrowing of an amount that is typically greater than the face value of the debt backed by that collateral. The rehypothecating lender effectively borrows the collateral haircut from the borrower. I show that when the lender's cash flows are sufficiently pledgeable to the borrower, rehypothecation is a Pareto improvement on securitisation. I also investigate the implications of rehypothecation for monetary policy. I show that when a central bank conducts an open market operation when collateral is scarce, it affects collateral constraints down the rehypothecation chain in the repo market in a way that is counterproductive to its objective of influencing output. I find empirical evidence for this channel in the cost of borrowing in the bilateral repo market. The policy implications of this result include conducting open market operations when
collateral is idle and purchasing assets less likely to be used as collateral.

**Identifying the “Push effects” of Foreign Fund Inflows on Emerging Equity Markets (with Ajay Shah)**

Abstract—There is a strong correlation between foreign fund flows and stock prices in emerging markets. The correlation could be driven by news about the emerging market (the pull, or supply, factor) or by liquidity conditions of the foreign investors (the push, or demand, factor). Emerging market policy often demands the knowledge of the extent of the contribution of the push factor in the correlation. We use the exogenous liquidity conditions of funds based in the US to isolate and identify this push factor for firms without a global component in their cash flows stream. Results for India indicate that stocks which face inflows and outflows do not significantly react to them any more than stocks which do not face flows. Aggregate flows may affect the market (the pricing factor) as a whole, but flows into or out of specific stocks do not affect them in addition to the effect through the pricing factor.

**Macroeconomic Models for Monetary Policies: A Critical Review from a Finance Perspective (with Winston Dou, Andrew Lo and Harald Uhlig)**

Abstract—We survey the macroeconomic models for monetary policy at central banks from a finance perspective. The complex yet crucial role played by financial systems in monetary policy and macroeconomic forecasting had been largely overlooked in the formal tools used by monetary authorities. We review the history of the monetary policy modeling and set forth a simple and canonical framework that incorporates the key up-to-date theoretical advances for the reader unfamiliar with the literature. As this is done, challenges for the existing models and quantitative methodologies are brought out. The topics discussed are: (1) government balance sheet and unconventional monetary policies, (2) heterogeneity, reallocation and redistribution effects, (3) macroeconomic impact of sizable and nonlinear risk premium dynamics, (4) time-varying uncertainty, (5) financial sector and systemic risks, (6) imperfect product market and markups, and (7) solution, estimation and evaluation methods for dynamic quantitative structural models. At last, we review the core monetary models employed by the major central banks.

**Scheduled Macroeconomic Announcements and Implied Volatility**

Abstract—I test the effects of scheduled macroeconomic announcements on the change in the VIX index. I control for the movement of the S&P 500 index because the VIX index is very strongly driven by it. I find that on announcement days, as uncertainty is realised and prices adjust sharply, the VIX falls over and above its movement due to the S&P 500 index. Also, since the VIX is a measure of expected volatility, only prior expectations of the particulars of an announcement (such as the rate to be set by the FOMC), and not the actual announcement or decision, may have any effect on the VIX on the announcement day. I provide evidence of this by using Federal Funds futures prices to look at prior expectations of the rate-setting decision of the FOMC.

**Research In Progress**

**Quantitative Easing as Equilibrium Selection--a Note**

Abstract—I exploit the existence of multiple equilibria in New Keynesian models to propose a role for long-term interest rates as an additional policy tool to short-term interest rates during liquidity traps. New Keynesian models argue for Taylor rules to
obtain unique equilibria. My solution is to abandon the Taylor rule and use the short-
term and long-term interest rates simultaneously to pin down equilibria. This is in
the spirit of the fiscal theory of the price level where overdetermined non-Ricardian
policies select among equilibria. I show with an example that a Pareto improvement
over the no-commitment solution during a liquidity trap can be feasibly obtained as
a unique equilibrium by adjusting the short-term rate and a long-term rate.

**Crises and Prices: Exogenous as well as Endogenous Public Information**

Abstract—I introduce an exogenous public signal (news) in addition to the
endogenous price signal in a global games model of a crisis, and study the interaction
between the exogenous and endogenous signals. I show that there is a unique price
process when dividends are exogenous, and that this price becomes a more accurate
indicator of the fundamentals if either the private or the public noise becomes small.
The speed with which its accuracy increases as either noise becomes small is
sufficient to guarantee multiple equilibria. In the region of uniqueness, I also look at
the effect of the precision of the news on the sensitivity of the likelihood of regime
collapse to the news shock, and find that a more credible public signal increases this
sensitivity.
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PRIOR EDUCATION
University of Tokyo, M.A., 2011

CITIZENSHIP
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GENDER
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FIELDS
Primary: Labor Economics
Secondary: Market Design, Microeconomic Theory, Applied Econometrics

TEACHING EXPERIENCE
Labor Economics (graduate, 14.661, Professor Joshua Angrist, 2013)
Labor Economics (graduate, 14.661, Professors Daron Acemoglu and Parag Pathak, 2014)
Market Design (graduate, 14.125, Professor Parag Pathak, 2014 and 2015)

**RELEVANT POSITIONS**
- Research Assistant to Professor Whitney Newey (2013)
- Research Assistant to Professor Masahiko Aoki (2009-11)
- Research Assistant to Professor Herbert Gintis (2008)

**FELLOWSHIPS, HONORS, AND AWARDS**
- Best undergraduate thesis award at the economics department of the University of Tokyo (2009)

**PROFESSIONAL ACTIVITIES**
- Referees for *Journal of Economic Theory* and *Economic Theory*
- Presentations at NSF/CEME Decentralization Conference at Boston University (2013)
- NSF/NBER Mathematical Economic/General Equilibrium Conference at the University of Iowa (2011)

**PUBLICATIONS**

**RESEARCH PAPERS**
- “Match or Mismatch: Learning and Inertia in School Choice” (Job Market Paper)
  Centralized matching markets are designed assuming that participants make well-informed choices upfront. However, this paper uses data from NYC’s school choice system to show that families’ choices change after the initial match as they learn about schools. I develop an empirical model of evolving demand for schools under learning, switching costs, and endogenous demand changes in response to prior assignments. These model components are identified by using admissions lotteries and other institutional features. The estimates suggest that there are substantially more changes in underlying demand than in observed choices, undermining the welfare performance of the initial match. I then investigate dynamic mechanisms that best accommodate choice changes in theory. These mechanisms improve on the existing discretionary reapplication process and initial match. Nevertheless, the mechanisms achieve no more than half of the gains from a frictionless benchmark with accelerated learning or active reapplications. Thus, in the dynamic real world, demand-side frictions determine the gains from a centralized market as much as its design.

- “Natural Experiments and Strategy-proofness”
  In centralized school admissions systems, rationing at oversubscribed schools often involves lotteries on top of preferences of students and schools. This partly random assignment is extensively used by empirical researchers to identify the effect of getting in a school on outcomes such as test scores. This paper theoretically studies whether a widely used empirical research design extracts a
random assignment as intended. For a class of mechanisms containing most of those used in practice, I obtain the following: The research design successfully extracts a random assignment under a data-generating mechanism if and almost only if the mechanism is strategy-proof for schools. Since some mechanisms are strategy-proof while others are not, this result provides justifications as well as caveats for empirical work using mechanism-generated randomization. These implications hinge on strategy-proofness as an algorithmic property and do not require that schools have preferences or are strategic in reality.

A growing number of school districts use centralized assignment mechanisms to allocate school seats in a manner that reflects student preferences and school priorities. Many of these assignment schemes use lotteries to ration seats when schools are oversubscribed. The resulting random assignment opens the door to credible quasi-experimental research designs for the evaluation of school effectiveness. Yet the question of how best to separate the lottery-generated variation integral to such designs from non-random preferences and priorities remains open. This paper develops easily-implemented empirical strategies that fully exploit the random assignment embedded in the widely-used deferred acceptance mechanism and its variants. We use these new methods to evaluate charter schools in Denver, one of a growing number of districts that integrate charter and traditional public schools in a unified assignment system. The resulting estimates show large achievement gains from charter school attendance. Our approach generates substantial efficiency gains over ad hoc methods that fail to exploit the full richness of the lotteries generated by centralized assignment with random tie-breaking.

“Promoting School Competition Through School Choice: A Market Design Approach” (with John Hatfield and Fuhito Kojima)
Revise and resubmit, Journal of Economic Theory
We study the effect of different school choice mechanisms on schools’ incentives for quality improvement. To do so, we introduce the following criterion: A mechanism respects improvements of school quality if each school becomes weakly better off whenever that school improves, i.e., becomes more preferred by students. We first show that neither any stable mechanism nor mechanism that is Pareto efficient for students (such as the Boston and top trading cycles mechanisms) respects improvements of school quality. Nevertheless, for large school districts, we demonstrate that any stable mechanism approximately respects improvements of school quality; by contrast, the Boston and top trading cycles mechanisms fail to do so. Our simulations show that, even for small markets, stable mechanisms almost always respect improvements while the other two mechanisms frequently violate it. Thus, a stable mechanism may provide better incentives for schools to improve themselves than the Boston and top trading cycles mechanisms.
GIANNI REGGIANI  
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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)  
PhD, Economics, Expected completion June 2016  
DISSERTATION: “Essays on Rational Inattention”

DISSERTATION COMMITTEE AND REFERENCES
Professor Abhijit Banerjee  
MIT Department of Economics  
77 Massachusetts Avenue, E17/201A  
Cambridge, MA 02139  
617-253-8855  
banerjee@mit.edu

Professor Bengt Holmstrom  
MIT Department of Economics  
77 Massachusetts Avenue, E17/220  
Cambridge, MA 02139  
617-253-0506  
bengt@mit.edu

PRIOR EDUCATION
Bocconi University, Milan, Italy  
M.Sc. summa cum laude, Economics and Social Sciences  
2010  

Bocconi University, Milan, Italy  
B.A. summa cum laude, Economics and Social Sciences  
2008

CITIZENSHIP
Italy  

GENDER: Male

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

FIELDS
Primary Fields: Macro, Theory  
Secondary Fields: Political Economics, Financial Economics
<table>
<thead>
<tr>
<th><strong>TEACHING EXPERIENCE</strong></th>
<th>14.02 Macroeconomics (Undergraduate)</th>
<th>Spring 2015</th>
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<tbody>
<tr>
<td></td>
<td>Head Teaching Assistant to Prof. James Poterba</td>
<td>Fall 2014</td>
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<tr>
<td></td>
<td>14.02 Macroeconomics (Undergraduate)</td>
<td>Spring 2013</td>
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<td></td>
<td>Head Teaching Assistant to Prof. Paul Willen</td>
<td>Fall 2014</td>
</tr>
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<td></td>
<td>14.454 Financial Crises (Graduate)</td>
<td>Spring 2013</td>
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<tr>
<td></td>
<td>Teaching Assistant to Prof. Ricardo Caballero</td>
<td>Fall 2014</td>
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<td></td>
<td>14.02 Macroeconomics (Undergraduate)</td>
<td>Spring 2013</td>
</tr>
<tr>
<td></td>
<td>Teaching Assistant to Prof. Fernando Broner</td>
<td>Spring 2013</td>
</tr>
</tbody>
</table>

| **RELEVANT POSITIONS** | Goldman Sachs, Global Investment Research. Summer Intern | 2008 |

<table>
<thead>
<tr>
<th><strong>FELLOWSHIPS, HONORS, AND AWARDS</strong></th>
<th>Urban Services Initiative (JPAL and Gates Foundation) 2015</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Weiss Family Research Grant 2014</td>
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<td>Schultz Fund Research Grant 2013</td>
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<td>MIT Fellowship 2010-2012</td>
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<td>Bocconi Outstanding Scholar Society (Graduate Merit Award) 2008-2010</td>
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<tr>
<td></td>
<td>Fiat Merit Award 2008</td>
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<table>
<thead>
<tr>
<th><strong>RESEARCH PAPERS</strong></th>
<th>“Optimal Contracts for Information Acquisition with Entropic Costs” (Joint with A. Clark)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>We study a principal-agent problem where the agent is entrusted with collecting and processing information to make a decision on behalf of a principal and where the cost of acquiring information is given by the average reduction in the entropy of the prior. The principal cannot monitor the information acquisition of the agent and therefore a moral hazard problem arises. The principal can incentivize the agent to collect information with a contract that depends on the realized state of the world and the chosen decision. We show that the optimal contract has a linear structure: the agent receives a fixed fraction of output, a state dependent payoff, and a decision dependent payoff. This implies that the optimal contract is linear in differences. We provide conditions on the prior and output under which the optimal contract is linear.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>“Stock Market Performance and Political Proximity: the Costs of Conflict of Interest”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I conduct a study that estimates the distortions due to conflict of interest during Berlusconi’s rule over Italy. The identification is based on the efficient market hypothesis. In particular, I use electoral polls and stock market data to estimate the effect of surprising electoral outcomes, defined as the difference between actual and expected electoral results, on the stock market performance of Berlusconi’s firms. I find evidence that there are substantial distortions due to conflict of interest: 6% increase of market capitalization per percentage point of a positive electoral surprise. I then match two of Berlusconi’s companies</td>
</tr>
</tbody>
</table>
operating in the same media sector but in different countries. This allows me to further test whether the extra returns are due to political distortions under different regulatory authorities. I find that the abnormal returns can be ascribed to “conflict of interest” rather than to the CEO-founder stepping down. Finally, I perform robustness tests to ensure that the cumulative abnormal returns estimates are not spurious.

“Counting votes right: strategic voters versus strategic parties” (Joint with F. Mezzanotti)

Voters are defined to be strategic if they switch their vote from their favorite candidate to one of the main contenders in a tossup election. High levels of strategic voting are a concern for democracy and the allocation efficiency of government goods. We use a clean quasi experiment to highlight the shortcomings of previous identification strategies, which fail to fully account for the strategic behavior of parties. In an ideal experiment, we would want to observe two identical votes with exogenous variation in the party victory probability. Among world parliamentary democracies 104 have a unique Chamber, 78 have two Chambers with different functions, and only one nation has two Chambers with the same identical functions: Italy. This allows us to observe two identical votes and therefore a valid counterfactual. In addition, the majority premiums are calculated at the national level for the Congress ballot and at the regional level for the Senate one. This provides exogenous variation in the probability of victory. Because the two Chambers have identical functions, a sincere voter should vote for the same coalition in the two ballots. A strategic voter would instead respond to regions’ specific victory probabilities. We approach this hypothesis with a geographical Regression Discontinuity approach, which allows us to compare voters across multiple regional boundaries. We find much smaller estimates (5%) and argue that previous larger estimates (35% to 80%) confounded strategic parties and strategic voters due to the use of non-identical votes as counterfactuals.

RESEARCH IN PROGRESS

“Slipped my Mind: Hand Washing and Habit Formation” (with R. Hussam and N. Rigol)

Diarrheal disease and respiratory infection are two leading causes of child mortality in the developing world, amounting to upwards of 3 million deaths per year. These deaths are often due to bacterial and viral contamination, deemed to be largely preventable through improved hand hygiene. Nevertheless, hand washing with soap is a largely absent phenomenon across the developing world, particularly in the context of our study, rural West Bengal. We explore a series of interventions aimed at generating sustained behavioral change in hand hygiene via habit formation. The project involves two steps: first, we develop a device which non-invasively measures and monitors hand washing and delivers objective data on frequency and time of use. We then utilize this device to design a set of interventions aimed at not only increasing immediate take-up of hand washing, but also creating a long-term hand washing habit. We explore the role of information, monitoring, reminders, and monetary incentives in the transformation of hand washing from a costly to a desired (craved) activity.
Project Poster: http://economics.mit.edu/files/9748
Measurement Device: http://economics.mit.edu/files/9714
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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2016
DISSERTATION: “Skill Mismatch and Structural Unemployment”

DISSERTATION COMMITTEE AND REFERENCES

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Professor Abhijit Banerjee
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Professor Ivan Werning
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iwerning@mit.edu

PRIOR EDUCATION
Universidad de los Andes
BA in Economics (2010)
BA in Mathematics (2010)

CITIZENSHIP
Colombian

GENDER: Male

LANGUAGES
English and Spanish (Native)
Fields

Primary Fields: Macroeconomics and Labor.

Secondary Fields: Political Economy.

Teaching Experience

TA for the course “Group Inequality,” taught by Professors Glenn Loury (Brown) and Rajiv Sethi (Columbia) at Los Andes University.

Relevant Positions

Full-time research assistant for Professor Daron Acemoglu from 2012 to 2016.

Fellowships, Honors, and Awards

Presidential fellowship, MIT (2011)

Summa Cum Laude, Universidad de los Andes (2010)


Participant at the Clay Mathematics Research Academy (2005)

Best Undergraduate Paper Award, Universidad de los Andes (2009)

Professional Activities


Publications


Research Papers

“Skill Mismatch and Structural Unemployment,” Job Market Paper. To study the effect of structural change on labor markets, I build a model in which structural change creates a mismatch between novel jobs skill requirements and workers’ current skills. When the mismatch is severe, labor markets go through a prolonged adjustment process in which unemployment is amplified and job creation is low. Due to matching frictions, firms find less workers with the requisite skills for novel jobs
and respond by creating fewer jobs. The paucity of novel jobs creates an external amplification effect that increases unemployment for all workers—including those who already hold the requisite skills—and it discourages rapid skill acquisition by workers. Although structural change is a secular process, the mismatch interacts with the business cycle, causing a large and long-lasting increase in unemployment that concentrates in recessions. I demonstrate that the decline in routine-cognitive jobs outside manufacturing—a pervasive structural change affecting U.S. labor markets since 2000—caused a severe skill mismatch that contributed to the long-lasting increase in unemployment observed during the recent Great Recession. My evidence suggests that the external amplification effect outlined above is important. Moreover, I find that the skill mismatch amplified and propagated demand shocks at the local labor market level.

“Ilustración de la recta que hay entre el hombre y la máquina: implicaciones de la tecnología para el crecimiento, las partidas de factores y el desempleo,” with Daron Acemoglu. The advent of automation and the simultaneous decline in the labor share and employment among advanced economies raise concerns that labor will be marginalized and made redundant by new technologies. This paper examines this proposition in a task-based framework wherein tasks previously performed by labor are automated, more complex versions of existing tasks can be created, and in these new tasks labor tends to have a comparative advantage. We fully characterize the structure of equilibrium in this model, showing how the allocation of factors to tasks and factor prices is determined by the available technology and the endogenous choices of firms between capital and labor. We then demonstrate that although automation tends to reduce employment and the share of labor in national income, the creation of more complex tasks has the opposite effect, and both types of innovations contribute to economic growth. Our model endogenizes the direction of research and development towards automation and the creation of new complex tasks. Endogenous technology is consistent with a balanced growth path in which both types of innovations go hand-in-hand. More importantly, our analysis shows that the equilibrium self-corrects: an increase in automation reduces the wage to rental rate ratio, which discourages further automation and encourages greater creation of more labor-intensive tasks. This process restores the share of labor in national income and the employment to population ratio. Though the economy is self-correcting, the equilibrium allocation of research effort is not optimal. Automation is attractive to firms because it reduces wage payments. To the extent that wages reflect quasi-rents for workers, firms will engage in too much automation. Finally, we extend the model to include workers of different skills. We find that inequality increases during transitions, but the self-correcting forces of the economy limit the increase in inequality over longer periods.

“Democracy Does Cause Growth,” with Daron Acemoglu, Suresh Naidu and James Robinson. *Revise and Resubmit, Journal of Political Economy.* We provide evidence that democracy has a significant and robust positive effect on GDP per capita. In our empirical estimates, we use a dichotomous measure of
democracy that is coded from several sources to reduce measurement error and we control for country fixed effects and the rich dynamics of GDP, which otherwise confound the effect of democracy on economic growth. Our baseline results employ a dynamic panel model for GDP and demonstrate that in the long run democratizations increase GDP per capita by about 20%. We obtain similar results when we control for the GDP dynamics linearly or for the propensity to democratize on the basis of past GDP dynamics, and we estimate the effect of democratizations on GDP year-by-year. We obtain comparable estimates using regional waves of democratizations to instrument for democracy. Our results suggest that democracy increases future GDP because it encourages investment, increases schooling, induces economic reforms, improves public good provision, and reduces social unrest. We find little support for the view that in less developed economies democracy constrains economic growth.

“The Mounties and the Origins of Peace in the Canadian Prairies.”
In a study of the settlement of the Canadian Prairies, I ask whether differences in violence across regions reflect the historical ability of the state to centralize authority and monopolize violence. I compare settlements that in the late 1880s were located near Mountie-created forts with those that were not. Data from the 1911 Census reveal that settlements far from the Mounties’ reach had unusually high adult male death rates. Even a century later the violence in these communities continues. In 2014, communities located at least 100 kilometers from former Mountie forts during their settlement had 45% more homicides and 55% more violent crimes per capita than communities located closer to former forts. I argue that these differences may be explained by a violent culture of honor that emerged as an adaptation to the lack of a central authority during the settlement and subsequently persisted over time. Consistent with this interpretation, I find that those who live in once-lawless areas are more likely to hold conservative political views. In addition, I use data for hockey players to uncover the influence of culture on individual behavior. Though players interact in a common environment, those who were born in areas historically outside the reach of the Mounties are penalized for their violent behavior more often than those who were not.

OTHER SUBMITTED PAPERS


“Scarcity Without Leviathan: The Violent Effects of Cocaine Supply Shortages in the Mexican Drug War,” with Juan C. Castillo and Daniel Mejia.

“Bushes and Bullets: Illegal Cocaine Markets and Violence in Colombia,” with Daniel Mejia.
**Research in Progress**

“**Durable Crises,**” with Nicolas Caramp and David Colino.

We study the role that durable goods play in amplifying recessions. People consume a flow value out of their stock of durable goods, and so a decline in the demand for goods and services causes a disproportionate fall in the demand for durable goods. We show that commuting zones that were historically specialized in the production of durable goods experienced a larger decline in employment during the recent Great Recession than areas with less employment in durables. The reduction in the demand for durable goods spills over upstream. Because industries locate close to their suppliers, input-output linkages amplify the negative effects of employment at the local labor market level. The effects are particularly large in commuting zones specialized in the production of durable inputs utilized in the production of other durable goods. Finally, we show that the role of durables is stronger in commuting zones that experienced a boom from 2000 to 2007. This finding is consistent with the view that consumers and firms overbuilt their stock of durable goods before the recession, which forced firms providing durables to scale down production during the recession and the recovery.

“The Role of Rents and Productivity in Explaining the Rise in Inequality.”

“**Robotics and Aging,**” with Daron Acemoglu.

“The Effect of Industrial Robots on Employment,” with Daron Acemoglu.
**Matthew Rognlie**  
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**Massachusetts Institute of Technology**

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**Doctoral Studies**  
Massachusetts Institute of Technology (MIT)  
PhD, Economics, Expected completion June 2016  
Dissertation: “Essays on Savings, Investment, and Monetary Policy”

**Dissertation Committee and References**

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Professor Alp Simsek  
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**Prior Education**  
Duke University, 2010  
B.S. *summa cum laude*, Economics, Mathematics

**Citizenship**  
United States  
**Gender:** Male

**Fields**  
Primary Field: Macroeconomics  
Secondary Field: International Economics

**Teaching Experience**  
14.453 Economic Fluctuations (Graduate)  
Teaching Assistant to Professor Iván Werning  
Spring 2016
14.454 Economic Crises (Graduate)  
Teaching Assistant to Professor Ricardo Caballero  
Spring 2016

14.00 Math Camp (Graduate)  
Instructor  
Fall 2014

14.451 Dynamic Optimization Methods (Graduate)  
Teaching Assistant to Professor Alp Simsek  
Fall 2014

14.00 Math Camp (Graduate)  
Instructor  
Fall 2013

14.451 Dynamic Optimization Methods (Graduate)  
Teaching Assistant to Professor George-Marios Angeletos  
Fall 2013

**RELEVANT POSITIONS**

- Research Assistant to Professor Iván Werning  
  2011-2013
- Research Assistant to Professors Daron Acemoglu and David Autor  
  2011-2013

**FELLOWSHIPS, HONORS, AND AWARDS**

- James A. and Ruth Levitan Teaching Award  
  2014
- MIT School of Humanities, Arts, and Social Sciences Graduate TA of the Year Award  
  2013  
  Voted by the MIT Graduate Economics Association
- NSF Graduate Research Fellowship  
  2010-2015
- Faculty Scholar, Duke University  
  2010
- Allan Starling Jr. Best Thesis Prize in Economics  
  2010  
  Duke Economics Department
- Julia Dale Prize, Duke Mathematics Department  
  2010
- Chief Student Marshal, Duke University  
  2009
- Top 100, William Lowell Putnam Mathematical Competition  
  2009
- Phi Beta Kappa  
  2009
- Angier B. Duke Memorial Scholarship, Duke University  
  2006-2010
- United States Presidential Scholar  
  2006

**PUBLICATIONS**


**RESEARCH PAPERS**

“What Lower Bound? Monetary Policy with Negative Interest Rates” (Job Market Paper)

Policymakers and academics have long maintained that nominal interest rates face a zero lower bound (ZLB), which can only be breached through major institutional changes like the elimination or taxation of paper currency. Recently, several central banks have set interest rates as low as -0.75% without any such changes, suggesting that, in practice, money demand remains finite even at negative nominal rates. I study optimal monetary policy in this new environment, exploring the central tradeoff: negative rates help stabilize aggregate demand, but at the cost of an inefficient subsidy to paper currency. Near 0%, the first side of this tradeoff dominates, and negative rates are generically optimal whenever output averages below its efficient level. In a benchmark scenario, breaking the ZLB with negative rates is sufficient to undo most welfare losses relative to the first best. More generally, the gains from negative rates depend inversely on the level and elasticity of currency demand. Credible commitment by the central bank is essential to implementing optimal
policy, which backloads the most negative rates. My results imply that the option to set negative nominal rates lowers the optimal long-run inflation target, and that abolishing paper currency is only optimal when currency demand is highly elastic.

“Inequality and Aggregate Demand” (with Adrien Auclert)
We explore the quantitative effects of transitory and persistent increases in income inequality on equilibrium interest rates and output. Our starting point is a Bewley-Huggett-Aiyagari model featuring rich heterogeneity and earnings dynamics as well as downward nominal wage rigidities. A temporary rise in inequality, if not accommodated by monetary policy, has an immediate effect on output that can be quantified using the empirical covariance between income and marginal propensities to consume. A permanent rise in inequality can lead to a permanent Keynesian recession, which is not fully offset by monetary policy due to a lower bound on interest rates. We show that the magnitude of the real interest rate fall and the severity of the steady-state slump can be approximated by simple formulas involving quantifiable elasticities and shares, together with two parameters that summarize the effect of idiosyncratic uncertainty and real interest rates on aggregate savings. For plausible parametrizations the rise in inequality can push the economy into a liquidity trap and create a deep recession. Capital investment and deficit-financed fiscal policy mitigate the fall in real interest rates and the severity of the slump.

“Unique Equilibrium in the Eaton-Gersovitz Model of Sovereign Debt”
(with Adrien Auclert)
A common view of sovereign debt markets is that they are prone to multiple equilibria. We show that such multiplicity does not exist in the infinite-horizon model of Eaton and Gersovitz (1981), a widely adopted benchmark for analyses of these markets. When the value from government default is exogenous, the model features a unique Markov perfect equilibrium, which is also its unique subgame perfect equilibrium. We extend this uniqueness result to two alternative environments: one in which governments face a positive bound on the assets they can accumulate before default, and one in which they are allowed to re-access financial markets after default. Our results show that no improvement in a borrower’s reputation for repayment can be self-sustaining, thereby strengthening the Bulow and Rogoff (1989) argument that debt cannot be sustained by reputation alone.

“Investment Overhang and the Great Recession” (with Andrei Shleifer and Alp Simsek)
We present a model of investment hangover motivated by the Great Recession. In our model, overbuilding of residential capital requires a reallocation of productive resources to nonresidential sectors, which is facilitated by a reduction in the real interest rate. If the fall in the interest rate is limited by the zero lower bound and nominal rigidities, then the economy enters a liquidity trap with limited reallocation and low output. The drop in output reduces nonresidential investment through a mechanism similar to the acceleration principle of investment. The burst in nonresidential investment is followed by an even greater boom due to low interest rates during the liquidity trap. The
boom in nonresidential investment induces a partial and asymmetric recovery in which the residential sector is left behind, consistent with the broad trends of the Great Recession.

“Monetary Union Begets Fiscal Union” (with Adrien Auclert)
We propose a mechanism through which monetary union between countries leads to a stronger fiscal union. Although fiscal risk-sharing is valuable under any monetary regime, given nominal rigidities it is more important within a monetary union, when exchange rates can no longer adjust to offset shocks. As a result, countries in a monetary union are capable of achieving better risk-sharing, partly overcoming their lack of commitment. Still, equilibria without fiscal cooperation remain possible and imply inefficient cross-country dispersion in output. A proactive central bank can encourage transfers by providing extra accommodation when fiscal union is under stress.

“Aggregate Capital-Labor Substitution: Preferences, Not Just Technology”
In a multisector economy, substitution between capital and labor takes place at multiple levels. The aggregate elasticity of substitution is determined not only by the direct substitutability of capital and labor in each sector’s production technology, but also by household and firm substitution between consumption and intermediate goods of varying capital intensities. Generalizing Oberfield and Raval (2014), I show analytically how these margins combine to produce an aggregate relationship between the real interest rate and the capital-output ratio. With multiple capital goods, two crucial subtleties emerge. First, low-depreciation capital goods weigh more heavily in aggregation, since the net return accounts for a larger share of their user cost. Second, the relative prices of capital goods move endogenously in response to a change in real interest rates, because they are produced with different net capital intensities. Applying this framework to sectoral data for the US economy, I calculate the exact weights on each micro-level elasticity of substitution—in both preferences and technology—in a formula for the aggregate elasticity. Preliminary results imply that household preferences are weighted more heavily than technology. The most important force underlying the aggregate elasticity is, in fact, households’ willingness to substitute between housing services and other forms of consumption.
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DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2016
DISSERTATION: “Essays in Development Economics”

DISSERTATION COMMITTEE AND REFERENCES

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PRIOR EDUCATION
Stanford University, 2008
B.A. with Honors and Distinction, Economics

CITIZENSHIP
United States

GENDER
Male

LANGUAGES
English (native), Konkani (native), Spanish (intermediate), Hindi (beginner)

FIELDS
Primary Field: Development Economics
Secondary Field: Labor Economics
TEACHING EXPERIENCE

14.124 Microeconomic Theory IV (Graduate)  
Teaching Assistant to Professor Bengt Holmstrom, MIT  
Spring 2015

14.74 Foundations of Development Policy (Undergraduate)  
Teaching Assistant to Professors Abhijit Banerjee, Esther Duflo, and Ben Olken, MIT  
Spring 2015

Ec 2110 Econometrics I (Graduate)  
Supplemental Graduate Tutor, Harvard  
Fall 2014

Evaluating Social Programs  
Teaching Assistant for Executive Education, J-PAL  
Summers 2012, 2013; Spring 2012

14.04 Intermediate Microeconomic Theory (Undergraduate)  
Teaching Assistant to Professor Jawwad Noor, MIT  
Fall 2012

ECON 51 Economic Analysis II (Undergraduate)  
Teaching Assistant to Professor Liran Einav, Stanford  
Winter 2008

RELEVANT POSITIONS

Research Assistant for Professor Rob Townsend, MIT & NBER  
2012–present

Research Assistant for Professor Abhijit Banerjee, MIT  
2011

Research Professional, Chicago Booth Initiative on Global Markets  
2008–2010

FELLOWSHIPS, HONORS, AND AWARDS

USAID Development Innovation Ventures Stage I Grant  
2013

Karl Taylor Compton Prize (MIT)  
2013

MIT Center for International Studies Grant  
2013

George and Obie Shultz Fund Grant  
2011, 2013

Agricultural Technology Adoption Initiative Pilot Grant  
2012

MIT International Science & Technology Initiatives Grant  
2012

Innovations for Poverty Action Graduate Student Fund Award  
2011

National Science Foundation Graduate Research Fellowship  
2010–2015

Phi Beta Kappa, Stanford University  
2008

Philip Tabor Bennett Fellowship, Stanford University  
2007

Time Magazine Person of the Year  
2006

PROFESSIONAL ACTIVITIES

Northeast Universities Development Consortium Conference presenter, Brown University  
2015

ATAI/SIPA Experimental Impact Evaluations of CGIAR Research Agenda workshop discussant, MIT  
2014

Northeast Universities Development Consortium Conference presenter, Dartmouth University  
2012

Russell Sage Foundation Summer Institute in Behavioral Economics  
Summer 2014

Referee for American Economics Journal: Applied Economics

RESEARCH PAPERS

“Migration decisions and persistent earnings differentials: Evidence from Thailand” (Job Market Paper)  
I estimate the perceived cost of internal migration and associated labor supply elasticity in Thailand using the revealed-preference location decisions of workers. I develop a multiperiod model of the location decision where observed earnings are an imperfect proxy for the net present value of a migration. I use global commodity prices to construct instruments that identify permanent and transitory components of local earnings. Reduced-form evidence suggests that
workers are sensitive to the share of the permanent component in an earnings innovation. Given this, I estimate a structural model of migration to recover cost parameters, exploiting variation in net present value induced by the instruments. Over a range of discount rates, I estimate the average perceived cost of migration to an individual to lie between 0.3 and 1.1 times annual earnings. Fixed costs of moving (which include both financial and psychic costs) account for 60 percent of this, with the remaining 40 percent varying by distance. Furthermore, variation in idiosyncratic preferences is more than double the spatial variation in earnings. Using the structural parameter, I find that migration contributes 8.6 percentage points to local labor supply elasticity, split almost evenly between foreigners entering a province and locals exiting.

“Skimming off the top: The unintended consequences of market expansion in the Indian dairy industry”
(with Emily Breza and Arun Chandrasekhar)
Dairy producers in India use village cooperatives to combine their milk for sale in regional markets. In the last decade the government of the state of Karnataka has invested heavily in bulk milk chillers (BMCs) that drastically lower the time between production and refrigeration. By lowering the perceived risk of spoilage, chillers both raise the potential returns to quality and lower the cost of contamination through intentional dilution or adulteration. We measure how BMC access affects the production process through a difference-in-difference approach using village-level data from the district of Kolar. We find that production quantity increases with access to a chiller, but average production quality decreases, as does the likelihood of milk being rejected. The results are consistent with villagers increasing dishonest practices such as dilution after being connected to a BMC because they face less risk of being punished.

“Got (good) milk? Transparency, governance, and incentives for cleanliness in Indian dairy cooperatives”
(with Emily Breza, Arun Chandrasekhar, and Manaswini Rao)
Dairy producers in India use village cooperatives to combine their milk for sale in regional markets. Each cooperative elects a secretary in charge of management and finances, but institutions are weak and secretaries have significant scope to expropriate village funds. We ran a field experiment offering incentives to lower bacteria count in milk, mediated through the cooperative’s financial account. We experimentally varied whether cleanliness payments were publicly announced or disclosed only to the secretary. In a pilot study, 25 percent of secretaries in the public information treatment chose to opt out of any payment at all rather than receive publicly observable payments. Milk quality improved in both treatment arms relative to control, but improved more so under private information due primarily to the secretaries that dropped out. Results show that local bureaucrats may be willing to sacrifice performance and social surplus to limit institutional transparency.

“The household response to health shocks in Thailand”
(with Nathan Hendren and Rob Townsend)
We estimate the response to negative health shocks among households in Thailand. The paper takes advantage of detailed household financial data in a
panel covering 195 months through the Townsend Thai Project. Following a negative health shock, especially one that coincides with the loss of income, household earnings fall but per capita consumption remains stable or marginally increases. Four margins of household adjustment explain this pattern: (a) a departure of household members, especially those between ages 16 and 30; (b) an increase in transfers or gifts to the household; (c) a decline in household savings; and (d) a shift in consumption away from home produced goods towards market goods. We next plan to estimate heterogeneous household responses based on initial financial position, and then develop a model of household finance to estimate the welfare costs of adverse health events and evaluate the potential welfare gains from a national insurance policy.

“Risk sharing and technology adoption with partially observable income”

I extend the hidden income model of risk sharing to include a noisy signal of earnings, and then model the aggregate implications for endogenous technology adoption in a risk-sharing network. I first derive a condition to define precision of information and show that, conditional on the income process, aggregate welfare improves with precision. I then consider the model in a setting where agents endogenously adopt one of several technologies. As the information environment improves, diversification increases and aggregate welfare approaches the first best.
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PhD, Economics, Expected completion June 2016
Dissertation: “Essays on the determinants of international migration”

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in Economics (High Honors) and Mathematics 2008

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LANGUAGES
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FIELDS
Primary Fields: Development Economics
Secondary Fields: Labor Economics

TEACHING EXPERIENCE
14.04 Intermediate Microeconomic Theory (Undergraduate); Teaching assistant to Professor Juuso Toikka Fall 2015
14.74x Foundation of Development Policy (EdX); Teaching assistant to Professors Abhijit Banerjee, Esther Duflo, and Benjamin Olken  
Fall 2015

14.01 Principles of Microeconomics (Undergraduate); Teaching assistant to Professor Jeffrey Harris  
Spring 2015

14.771 Development Economics: Micro Issues (Graduate); Teaching assistant to Professors Benjamin Olken and Seema Jayachandran  
Fall 2014

14.003/14.03 Microeconomic Theory and Public Policy (Undergraduate/Graduate); Teaching assistant to Professor David Autor  
Fall 2014

14.73 The Challenge of World Poverty (Undergraduate); Teaching assistant to Professors Abhijit Banerjee and Suresh Naidu  
Spring 2014

14.74/14.740 Foundations: Development Policy (Undergraduate/Graduate); Teaching assistant to Professors David Donaldson and Esther Duflo  
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14.771 Development Economics: Micro Issues (Graduate); Teaching assistant to Professors Esther Duflo and Benjamin Olken  
Fall 2013

RELEVANT POSITIONS

Research assistant to Professor Esther Duflo, MIT  
Summer 2012

Junior Professional Associate, The World Bank Country Office, Kathmandu, Nepal  
Sept 2009 – Aug 2011

Research assistant to Professor Eric V. Edmonds, Dartmouth College  
2005-2011

FELLOWSHIPS, HONORS, AND AWARDS

George and Obie Shultz Fund grant  
Fall 2014

J-PAL Incubator fund for graduate students  
Spring 2015

MIT Department Fellowship  
2011-2013

Phi Beta Kappa, Junior year, Dartmouth College  
2007

Nelson A. Rockefeller Prize in Economics, Dartmouth College  
2008

James O. Friedman Presidential Scholar, Dartmouth College  
2008

Rufus Choate Scholar, Dartmouth College  
2007-2008

PROFESSIONAL ACTIVITIES

Seminars: NEUDC 2011

PUBLICATIONS

“You get what you pay for: Schooling incentives and child labor” (with Eric V. Edmonds)
*Journal of Development Economics*, 111, November 2014

“Independent child labor migration” (with Eric V. Edmonds)
in *International Handbook of the Economics of Migration*, ed. by Amelie F. Constant and Klaus F. Zimmermann, 2013

“The impact of minimum age of employment regulation on child labor and schooling” (with Eric V. Edmonds)

RESEARCH PAPERS

“Get rich or die tryin’: Perceived earnings, perceived mortality rate and the value of a statistical life of potential work-migrants from Nepal” (Job Market Paper)

Do potential migrants have accurate information about the risks and returns of migrating abroad? And, given the information they have, what is their revealed willingness to trade risks for higher earnings? To answer these questions, this paper sets up and analyzes a randomized field experiment among 3,319 potential work migrants from Nepal to Malaysia and the Persian Gulf countries. The experiment provides them with information on wages and mortality incidences in their choice destination and tracks their migration decision 3 months after the interventions. I find that potential migrants severely overestimate their mortality rate abroad, and information on mortality incidences lowers this expectation. Potential migrants without prior foreign migration experience also overestimate their earnings potential abroad, and information on earnings lowers this expectation. Using exogenous variation in expectations for the inexperienced potential migrants generated by the experiment, I estimate an earnings elasticity of migration of 0.7 and an elasticity of migration with respect to expected mortality of 0.5. The experiment allows me to calculate the trade-off the inexperienced potential migrants make between earnings and mortality risk, and hence the value of a statistical life (VSL) for these migrants. The estimates of the VSL are in the range of $0.28 million to $0.54 million ($0.97m - $1.85m in PPP), a reasonable range for a poor population. At this revealed willingness to trade earnings for mortality risk, misinformation lowers migration.

“Death scares: How potential work migrants infer mortality rate from migrant deaths?”

I study how potential work migrants infer mortality rates from incidents of migrant deaths. Using administrative databases on deaths and outflows of work-migrants from Nepal to Malaysia and the Persian Gulf countries, I investigate how death of a migrant from a district affects subsequent migration from the district. After controlling for confounds using district-month, destination-month and district-destination fixed effects, I find two key features of the migration response. First, migrant death lowers migration from the district in the subsequent 12 months. There is limited substitution across destinations as well as spillovers to neighboring districts. Second, the
migration response to a migrant death is stronger when there are more migrant deaths in the recent past. This indicates that the potential migrants over-weight recent deaths in forming their beliefs on mortality rates abroad. I then convert the migration response to change in perceived mortality rate abroad using the earnings elasticity of migration and the value of statistical life from Shrestha (2015). I find that one migrant death increases the perceived mortality rate by 6.7 per thousand for a two-year migration episode. This response is too large to be explained by a model of rational Bayesian learning. Models of learning fallacy, such as belief in the law of ‘small’ numbers, in conjunction with other heuristic decision making rules, can explain high response to death as well as large observed overestimation of mortality rate.

“Push and pull: A study of international migration from Nepal”
I study migration choices in the presence of liquidity constraints and varying costs of migration. I present a simple theoretical framework that analyzes migration response to both push and pull factors in such settings. This framework implies that a shock to the push factors in the origin leads to differential observed response to migration to various destinations, as they affect different parts of the wealth distribution. I test the implications of this framework in context of international migration from Nepal using a panel of 452 villages observed at three points in the 2000s. I use rainfall shocks and deaths due to conflict as ‘push’ shocks and growth in manufacturing and construction in destination countries as the ‘pull’ shocks. I find that a rainfall shock that increases household income by USD 100 increases migration to India by 54 percent but has no effect on migration elsewhere. Increase in conflict, which reduces consumption and amenity of the wealthier more, increases migration abroad, particularly from the urban areas. Increase in demand from the destination countries, particularly the Gulf countries and Malaysia has strong effects on migration to those destinations. These findings are consistent with the theoretical framework, and suggest presence of large liquidity constraints. Increase in income can boost migration to India whereas a reduction in cost of migration might increase profitable migration elsewhere. The responsiveness to ‘pull’ shocks suggests that households are willing to take advantage of these opportunities.
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Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2016
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PRIOR EDUCATION
University of Sao Paulo
MSc in Economics, 2011
BSc in Economics, 2008

CITIZENSHIP  Brazilian

GENDER:  Male
LANGUAGES

Portuguese (Native), English (Fluent)

FIELDS

Primary Fields: Macroeconomics, Finance

TEACHING EXPERIENCE

Advanced Macroeconomics I (Graduate, MIT course 14.461) Teaching Assistant to George-Marios Angeletos and Iván Werning, Fall 2015
Intermediate Macroeconomics (Undergraduate, MIT course 14.05) Teaching Assistant to Alp Simsek, Fall/Spring 2014
Public Economics I (Graduate, MIT course 14.471) Teaching Assistant to Iván Werning and James Poterba, Fall 2014
Principle of Microeconomics (Undergraduate, MIT course 14.01) Teaching Assistant to Jeffrey Harris, Spring 2014
Public Economics I (Graduate, MIT course 14.471) Teaching Assistant to Iván Werning and James Poterba, Fall 2013
Macroeconomics II (Graduate, USP) Teaching Assistant to Pedro Garcia Duarte, Fall 2010
Microeconomics II (Graduate, USP) Teaching Assistant to Gabriel Madeira, Fall 2010
Macroeconomics I (Graduate, USP) Teaching Assistant to Mauro Rodrigues, Spring 2010
Econometrics I (Graduate, USP) Teaching Assistant to Ricardo Avelino, Spring 2010
Statistics (Graduate, USP) Teaching Assistant to Ricardo Avelino, Spring 2010

RELEVANT POSITIONS

Research Assistant to Professor Robert M. Townsend 2012-15
Research Assistant to Professor David Autor 2014
Research Assistant to Professor Guido Lorenzoni 2012
Risk Analyst, Bank Nossa Caixa 2003-08

FELLOWSHIPS, HONORS, AND AWARDS

Macro Financial Modelling Group, Dissertation Fellowship 2014-15
Graduate Fellowship, Department of Economics, MIT 2011-13
Ryoichi Sasakawa Young Leaders Fellowship 2011
FAPESP Fellowship 2010
CNPq Scholarship, Msc in Economics 2009
First place in the National Graduate Admission Exam (ANPEC) 2009

PROFESSIONAL ACTIVITIES

Invited presentation: Macro Financial Modeling, Winter Meeting 2015
Macro Financial Modeling, Spring Meeting 2014
MIT Capital Markets Research Workshop 2013
Princeton Initiative: Macro, Money and Finance 2012
RESEARCH PAPERS

“The Risk Channel of Unconventional Monetary Policy” (Job Market Paper)
This paper examines how unconventional monetary policy affects asset prices and macroeconomic conditions by reallocating risk in the economy. I consider an environment with two main ingredients: heterogeneity in risk tolerance and limited asset market participation. Risk-tolerant investors take leveraged positions, exposing the economy to balance sheet recessions. Limited asset market participation implies the balance sheet of the central bank is non-neutral. Unconventional monetary policy reduces the risk premium and endogenous volatility. During balance sheet recessions, asset purchases boost investment and growth. In contrast, during normal times, the expectation of future interventions reduces growth by its impact on savings. A commitment by the central bank to unwind its portfolio early, conditional on the recovery of leveraged institutions' balance sheet, reduces the risk premium by more than strategies involving holding its portfolio for longer. Asset purchases also have implications for the concentration of risk. Leveraged institutions respond to the policy by reducing risk-taking relatively more than risk-averse investors. As risk concentration falls, the probability of negative tail-events is reduced, enhancing financial stability.

“Optimal Unconventional Monetary Policy: A Two-Period Example”
I study the optimal design of unconventional monetary policy in an environment with two frictions: limited asset market participation and a moral hazard in the financial sector that limits idiosyncratic risk sharing. I consider a two-period setting that allows for a sharp characterization of the optimal policy. I show that the optimal policy will always deviate from the full participation equilibrium, as the central bank faces a trade-off between correcting a pecuniary externality generated by the moral hazard problem and providing the appropriate exposure to risk to non-participants. Comparative statics exercises indicate the central bank should expand its balance sheet after negative shocks. Asset prices would vary less under the optimal policy compared to the laissez-faire equilibrium.

RESEARCH IN PROGRESS

“Entrepreneurship and Idiosyncratic Risk Premium in Village Economies”
(joint with Robert M. Townsend)
Data on the return of farm and non-farm business enterprises in Thailand indicates that idiosyncratic risk commands a positive price in equilibrium. We study the determination of the idiosyncratic risk premium and its implications in a life-cycle framework where entrepreneurs have limited insurance due to a moral hazard friction. We argue that the price of idiosyncratic risk is determined in the long-run by entrepreneur's savings behavior. In particular, an increase in the bequest motive will reduce the idiosyncratic premium, as it increases
entrepreneur's risk bearing capacity. A reduction in uninsurable volatility reduces the premium only in the short-run, as it reverts to the original level in the long-run. The effects of idiosyncratic volatility on growth and the distribution of capital depends on the strength of a precautionary motive. For high levels of risk aversion, a reduction in uninsurable volatility reduces growth and it increases the concentration of capital on older households. We test the predictions using data from business enterprises in Thailand and structurally estimate the model to evaluate the impact of a financial innovation that increases the availability of insurance to entrepreneurs.

“Fiscal fragility”
(joint with Nicolas Caramp)
We study how the level, maturity structure and asset composition of government debt affects the severity of crises and the effectiveness of stabilization policies. We consider a small modification of the basic New Keynesian model: we assume the government has access to distortionary taxation, but not to lump-sum taxes. In contrast to the pervasiveness of multiple equilibria in the New Keynesian literature, equilibrium is now unique. Second, both fiscal and monetary policies become less powerful in high debt economies, meaning both the fiscal multiplier and the response to changes in the monetary policy are attenuated. The level of debt also has implications for how the economy responds to shocks. In response to a preference shock that pushes the economy into a liquidity trap, high debt economies experience larger and more prolonged recessions. Moreover, the maturity structure and asset composition matters. Economies with the same level of debt, but a higher fraction of long-term debt will face a smaller recession in the liquidity trap experiment. An economy with a higher fraction of long-term indexed debt will have more effective stabilization policies and it will be less affected by the preference shock. Therefore, more indebted economies and economies that rely less on long-term or indexed debt are, in this sense, more fragile.
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DISSERTATION: “Essays on the Economics of Gender”

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PRIOR EDUCATION
University of California, Berkeley, 2007
Bachelor of Arts, Economics and German, magna cum laude

CITIZENSHIP
USA

GENDER: Female

FIELDS
Primary Field: Labor Economics, Economics of Gender
Secondary Field: Development Economics


<table>
<thead>
<tr>
<th>Teaching Experience</th>
<th>Microeconomic Theory and Public Policy (undergraduate, MIT)</th>
<th>Fall 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Assistant to Professor David Autor</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relevant Positions</th>
<th>Research Assistant, Professor David Autor, MIT</th>
<th>2009-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Assistant, Professors Esther Duflo and Abhijit Banerjee, Jameel Poverty Action Lab (J-PAL)</td>
<td>2008-09</td>
<td></td>
</tr>
<tr>
<td>Research Assistant, Professor Edward Miguel, UC Berkeley</td>
<td>2006-08</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fellowships, Honors, and Awards</th>
<th>NBER Aging and Health Pre-Doctoral Fellowship</th>
<th>2015-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Science Foundation, Graduate Research Fellowship</td>
<td>2010-2014</td>
<td></td>
</tr>
<tr>
<td>Phi Beta Kappa Honor Society</td>
<td>2006</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Research Papers</th>
<th>“Hours Constraints, Occupational Choice and Fertility: Evidence from Medical Residents” (Job Market Paper)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Papers</td>
<td>Do the long work hours required by high-paying professions serve as a barrier to entry for women, who may face a tradeoff between market time demands and family formation? I explore this question by studying the introduction of a policy in 2003 that capped the average workweek for medical residents at 80 hours. Using data on the universe of U.S. medical school graduates from 1993 to 2010, I find that an exogenous reduction in the weekly residency hours of medical specialties induced women to enter those specialties but yielded little change in men's entry. To shed light on why women and men responded differently to the reduction in residency hours, I analyze the effect of the reform on residents' fertility. Linking resident physicians to administrative birth data from two large U.S. states, I find that a reduction in a specialty’s weekly hours increased the specialty’s female fertility rate in California, but had no effect on the specialty’s female fertility rate in Texas. I discuss these results in the context of a model in which physicians choose between career and family investments during residency, trading off long term incomes, investments in children, and leisure.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Research Papers</th>
<th>“Family Disadvantage and the Gender Gap in Behavioral and Educational Outcomes” (with David Autor, David Figlio, Krzysztof Karbownik, and Jeffrey Roth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Papers</td>
<td>U.S. females graduate high school at higher rates than U.S. males, but the female-male educational advantage is far larger among black and low-SES students than among white and high-SES students. We explore why boys fare worse than girls in low SES households—both behaviorally and educationally—by exploiting matched birth certificates, health, disciplinary, academic, and high school graduation records for over one million children born in Florida between 1992 and 2002. To account for unobserved family heterogeneity, we contrast outcomes of opposite-sex siblings linked to birth mothers by administrative records. Relative to</td>
</tr>
</tbody>
</table>


their sisters, boys born to low-education and unmarried mothers, raised in low-income neighborhoods, and enrolled at poor-quality public schools have a higher incidence of truancy and behavioral problems throughout elementary and middle school, exhibit higher rates of behavioral and cognitive disability, perform worse on standardized tests, are less likely to graduate high school, and are more likely to commit serious crimes as juveniles. This correlation between family disadvantage and the sibling gender gap is not explained by gaps in pre-natal health: family disadvantage has no measurable relationship to the sibling gender gap in birth outcomes, including birthweight, APGAR scores, prenatal care adequacy, congenital anomalies, maternal health, and labor and delivery complications. The relationship is also not explained by the differential impact of schools and neighborhoods on boys relative to girls: although family disadvantage is strongly correlated with schools and neighborhood quality, the SES gradient in the sibling gender gap is almost as large within schools and neighborhoods as between them. A surprising implication of our findings is that, relative to white siblings, black boys fare worse than their sisters in significant part because black children—both boys and girls—are raised in more disadvantaged family environments.

**Research In Progress**

“Gender Differences in Politician Persistence”

Why do women remain underrepresented in elective offices, particularly at the highest levels? In this paper, I investigate whether there are gender differences in the persistence of politicians in response to an electoral loss. Using California local election returns from 1995 to 2012, and a regression discontinuity design, I analyze the subsequent political involvement of men and women who ran in close elections. After losing in a close election, women are ten percentage points less likely to run again within four years than men who lose in similarly close contests. By contrast, there is no gender difference in the effect of losing in a close election on running and winning in a subsequent election. I document that the gender disparity in the decision to run again cannot be explained by differing outside options (i.e. occupations) of men and women, but that the gap is larger in elections for offices that have historically low female representation. I show that these results are consistent with a model in which politicians base their decision to run for elective office on their expected probability of winning, which depends on voter perceptions of their competence. If risk-averse voters choose candidates based on noisy signals of political competence, with the precision of the signals greater for male than for female candidates, then female candidates who lose in close races have a lower probability of winning on their second attempt.

“Do Employers Condition Wages on Women’s Future Fertility?”

This paper investigates whether employers set female workers’ wages based on expected labor supply declines associated with childbearing. I leverage a predictor of future fertility that is arguably unobserved by employers when workers enter the labor market: the number of siblings in the worker’s family. Building on the existing empirical employer learning literature (Farber and Gibbons, 1996; Altonji and Pierret, 2003), I test whether employers learn about and progressively incorporate workers’ future fertility into wages by examining the time-varying importance of this predictor of future fertility in a wage regression. Using data
from the NLSY79, I demonstrate that while this fertility predictor has little effect on wages upon labor market entry, its correlation with wages grows over time for women but not for men. Moreover, I show that the growing importance of the fertility predictor is robust to the inclusion of controls for the worker’s occupation, as well as the direct effect of having kids of wages. These results are consistent with the predictions of a dynamic model of investment in firm-specific human capital, in which employers progressively learn about workers’ labor force commitment.

**OTHER PUBLICATIONS**

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Secondary Field: Industrial Organization
TEACHING EXPERIENCE

Energy Economics and Policy (Undergraduate)  Spring 2014
Teaching Assistant for Professor Christopher Knittel  &2015

RELEVANT POSITIONS

Research Assistant for Professor Heidi Williams, MIT  2013-2015
Research Assistant for Professors Amy Finkelstein and Heidi Williams, MIT and NBER  2012-2013
Research Assistant for Professor Jonathan Gruber, MIT  2011
Research Assistant for Professor Richard Zeckhauser, Harvard  2010-2011
Research Assistant for Professor Ulrike Malmendier, UC Berkeley  2010

FELLOWSHIPS, HONORS, AND AWARDS

Ewing Marion Kauffman Dissertation Fellowship  2015
MIT George and Obie Shultz Fund Grant (with Manisha Padi)  2015
MIT George and Obie Shultz Fund Grant  2014
MIT Department of Economics Fellowship  2011-2013
Tsinghua University-Morgan Stanley Research Scholarship  2010
Tsinghua University Scholarship for Academic Excellence  2007-2010

PROFESSIONAL ACTIVITIES

Referee for Journal of Public Economics

RESEARCH PAPERS

“Supply Response to Consumer Inertia: Strategic Pricing in Medicare Part D” (Job Market Paper)

A growing literature has documented evidence that consumers in health insurance markets are inertial, or behave as though they face substantial switching costs in choosing a health insurance plan. I investigate whether the private firms which provide prescription drug insurance through Medicare Part D exploit this inertia when setting prices. I first document descriptive evidence consistent with insurers initially setting low prices in order to “invest” in future demand before later raising prices to “harvest” inertial consumers. I then apply a two-step estimation approach following Bajari, Benkard and Levin (2007) to explore the implications of these invest and harvest incentives for equilibrium pricing, finding that on net, demand inertia reduces equilibrium prices (i.e. the invest incentive dominates the harvest incentive). Finally, I evaluate welfare consequences of policies that could be used to constrain insurers’ ability to conduct such invest-then-harvest pricing patterns. I find, for example, that a policy change to cap premium increases would improve consumer welfare by both lowering average premiums and smoothing prices over time.

RESEARCH IN PROGRESS

“Does the Meaningful-Difference Regulation Make a Meaningful Difference? Welfare Impacts of Prohibiting Strategic Entry and Product Proliferation”

There has been empirical evidence that firms exploit demand inertia when setting prices in a variety of markets including health insurance settings. I investigate strategic entry as another response to consumer inertia in the Medicare Part D market: since price discrimination across new and old enrollees is banned, firms face an incentive to continuously introduce new plans that can be priced low to “invest” in future demand while charging higher premiums to incumbent consumers. I provide descriptive evidence consistent with such strategic product proliferation. A “meaningful-difference” regulation introduced in 2010 attempted to limit such behavior by requiring new plans to be sufficiently differentiated in coverage from existing plans by the same insurer. To quantify its impact on insurance supply and consumer welfare, I will enrich a model of insurers’ dynamic pricing with entry decisions, and use
baseline variation in entries and market structure to identify the distribution of entry cost prior to the regulation. In order to assess the general desirability of adopting similar regulations in insurance markets, I will then simulate counterfactual welfare if this regulation had been in place when this market first opened; and if that the same insurer can offer only two plans based on a recent policy proposal.

“Market Size and Innovation: The Intermediary Role of Pharmaceutical Licensing” (with Manuel Hermosilla)

Motivated by prior work on market size spurring innovation, we study the role of increased downstream demand in facilitating inter-firm cooperation in the pharmaceutical industry, where licensing is a common form of collaboration between upstream innovators and downstream commercializers. We propose a simple model of licensing with heterogeneous match quality which predicts that positive demand shocks will increase the likelihood of licensing and improve match quality by reducing the relative importance of transaction costs. We then use the differential impacts of the introduction of Medicare Part D across drug categories targeting different ages of consumers as a source of variation in demand, and document empirical evidence consistent with the model.

“Uncertain Plan Quality and Consumer Learning in Medicare Part D” (with Manisha Padi)

Health insurance plans are complex contracts that function as experience goods, due to consumers' uncertainty over their own health status and over plan generosity. We exploit unique features of Medicare Part D in order to study the role of consumer learning in designing and pricing health insurance products. A novel feature of learning in this setting is differential learning across consumers with different unobserved health types, conditional on selection into plans and observed enrollee risk. Consumers learn upon the arrival of claims, and belief updating increases with frequency of utilization. The uncertainty over match quality of a consumer-plan pair may never be resolved for a healthy consumer. We follow Israel (2005) to identify a demand model with this type of learning, using random arrival of signals due to differential health realizations across similar consumers. The interaction between learning and adverse selection has important implications for insurers’ dynamic adjustments of quality and prices. We will model and estimate supply in the presence of this effect and finally simulate effects of relevant counterfactual policies.