

BOSTON UNIVERSITY

PLACEMENT BROCHURE

2020-2021

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2021 PhD Candidates at Boston University Department of Economics

Dear Colleague:

Attached please find the CVs and abstracts of the **Ph.D. students** formally on the job market from the Boston University Department of Economics. This is a very strong cohort, and I encourage you to consider our students carefully for any job openings that you may have.

As you may be aware, our department has grown significantly in quality and stature and is now one of the top-rated economics departments in North America and the world, currently ranked 15th in the world by [REPEC](#) based on research papers and publications. This change in quality has been mirrored in the quality of our graduate students. In the **last five years**, our doctoral candidates have taken tenure-track jobs at Brown University, Harvard Medical School, London School of Economics, Penn State, Renmin, Shanghai University of Finance and Economics, SUNY, Texas A&M, Warwick, and other fine universities and colleges. Our students have also found research positions at the US Census, the Federal Reserve Board, the Inter-American Development Bank, and the World Bank; post-doc positions at Columbia, Duke, Dartmouth, Harvard, MIT and Princeton; and jobs at Amazon, Analysis Group, Charles River Associates, and many other top companies, research institutes, banks, and central banks.

Reflecting a continuing increase in the quality of our entering graduate students and our stringent standards for remaining in the Ph.D. program, we have an excellent group of job market candidates this year. I urge you to closely study the summaries of these candidates and to be in touch with them, their advisors, or me if you need any further information.

This full booklet, as well as job market candidate web pages and research papers, are available on our website at <http://www.bu.edu/econ/phd/phdcandidates/>.

You can contact me at garettos@bu.edu, by phone at (617) 358-5887. I will be happy to talk with you about any of the candidates. If you have difficulty reaching a candidate, please feel free to contact me or the Ph.D. program administrator Mirtha Cabello by email (cabello@bu.edu) or phone at 617-353-4454.

I hope the enclosed packet will be useful in your recruiting efforts.

Sincerely yours,

A handwritten signature in black ink that reads "Stefania Garetto".

Stefania Garetto
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Boston University Department of Economics Faculty

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PhD Program Administrator: Mirtha Cabello, cabello@bu.edu, (617) 353-4454

Sort by: [Name](#), [Field](#)

Undral Byambadalai



Fields: Econometrics, Applied Microeconomics

Job Market Paper: Identification and Inference for Welfare Gains without Unconfoundedness

[C.V.](#) | [Website](#) | undral@bu.edu

References: [Hiroaki Kaido](#), [Ivan Fernandez-Val](#), [Albert Ma](#), [Jean-Jacques Forneron](#)

Lester Chan



Fields: Microeconomic Theory, Industrial Organization

Job Market Paper: Weight-Ranked Divide-and-Conquer Contracts

[C.V.](#) | [Website](#) | lctlabc@bu.edu

References: [Albert Ma](#), [Bart Lipman](#), [Alex White](#)

Pablo Cuellar Tapia



Fields: Applied Microeconomic Theory, Law and Economics
Job Market Paper: Voluntary disclosure of evidence in plea bargaining

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References: [Juan Ortner](#), [Bart Lipman](#), [Dilip Mookherjee](#)

Taosong Deng



Fields: Econometrics, Quantitative Macroeconomics, Empirical Finance

Job Market Paper: Inference in Predictive Regressions with Persistent Predictors

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Gerard Domenech Arumi



Fields: Labor Economics, Public Economics, Political Economy

Job Market Paper: Neighborhoods, Perceived Inequality and Preferences for Redistribution: Evidence from Barcelona

[C.V.](#) | [Website](#) | domenech@bu.edu

References: [Daniele Paserman](#), [Ray Fisman](#), [Johannes Schmieder](#)

Thomas Gautier



Fields: Development Economics, Political Economy

Job Market Paper: Refugee Settlement and Social Integration: Evidence from Syrians in Turkey

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References: [Sam Bazzi](#), [Dilip Mookherjee](#), [Daniele Paserman](#)

Youming Liu



Fields: Industrial Organization, Environmental Economics, Chinese Economy

Job Market Paper: Competition for Exclusivity and Customer Lock-in

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References: [Marc Rysman](#), [Shanjun Li](#), [Jihye Jeon](#), [Panle Jia Barwick](#)

Sophia Ying Liu



Fields: Health Economics, Economic History, Empirical Microeconomics

Job Market Paper: Re-evaluating the Effects of the 1918 Influenza Pandemic on Human Capital Development: The Role of the Great Depression

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References: [Robert Margo](#), [Daniele Paserman](#), [Randall Ellis](#), [Jay Zagorsky](#)

Enkhjargal Lkhagvajav



Fields: Macroeconomics, Economic Growth, Economics of Innovation

Job Market Paper: Patent Disclosure, Firm Innovation, and Growth

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References: [Stephen Terry](#), [Pascual Restrepo](#), [Adam Guren](#), [Michael Meurer](#)

Yang Ming



Fields: Macroeconomics, Economics of Innovation, Applied Econometrics

Job Market Paper: Good Dispersion in Bad Times: A Story of R&D Heterogeneity

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References: [Christophe Chamley](#), [Stephen Terry](#), [Jianjun Miao](#), [Robert G. King](#)

Julio Ortiz



Fields: Macroeconomics, Econometrics

Job Market Paper: Spread too Thin: The Impact of Lean Inventories

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References: [Stephen Terry](#), [Adam Guren](#), [Pascual Restrepo](#)

Cheonghum Park



Fields: Political Economy, Behavioral Finance, Labor Economics

Job Market Paper: Investor Attention to Firm versus Market-wide Information Shocks: Evidence from North Korean Missile Tests

[C.V.](#) | [Website](#) | chpark@bu.edu

References: [Ray Fisman](#), [Daniele Paserman](#), [Sam Bazzi](#)

Fernando Payro Chew



Fields: Microeconomic Theory, Decision Theory, Behavioral Economics

Job Market Paper: Mixture-Dependent Preference for Commitment

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References: [Larry Epstein](#), [Jawwad Noor](#), [Bart Lipman](#)

Anlong Qin



Fields: Econometrics, Time Series Econometrics, Financial Econometrics

Job Market Paper: Modeling Regime Switching in High Dimensional Data with Applications to U.S. Business Cycles

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References: [Zhongjun Qu](#), [Pierre Perron](#), [Hiroaki Kaido](#)

Zhouxiang Shen



Fields: Macroeconomics, Finance

Job Market Paper: Production of private safe assets and macroprudential policy

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References: [Jianjun Miao](#), [Stephen Terry](#), [Adam Guren](#)

Chenlu Song



Fields: Health Economics, Applied Microeconomics

Job Market Paper: What Saves More: Coinsurance or Copayment?

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References: [Randall Ellis](#), [Albert Ma](#), [Robert Margo](#)

Lisa Tarquinio



Fields: Development Economics, Political Economy, Environmental Economics

Job Market Paper: The Politics of Drought Relief: Evidence from Southern India

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References: [Dilip Mookherjee](#), [Tarek Hassan](#), [Ray Fisman](#)

Silvia Vannutelli



Fields: Public Economics, Political Economy, Labor Economics

Job Market Paper: From Lapdogs to Watchdogs: Random Auditor Assignment and Municipal Fiscal Performance in Italy

[C.V.](#) | [Website](#) | svann@bu.edu

References: [Ray Fisman](#), [Daniele Paserman](#), [Ilyana Kuziemko](#), [Johannes Schmieder](#)

Shuang Wang



Fields: Industrial Organization, Applied Microeconometrics

Job Market Paper: Price Competition with Endogenous Entry: The Effects of Marriott & Starwood's Merger in Texas

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References: [Marc Rysman](#), [Hiroaki Kaido](#), [Jihye Jeon](#), [Jacob LaRiviere](#)

Anna Weber



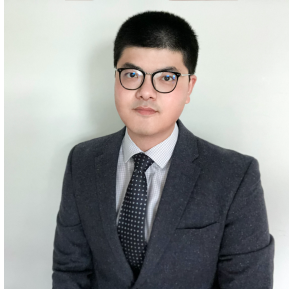
Fields: Labor Economics, Public Economics

Job Market Paper: The Big House Far From Home: Spatial Distance and Criminal Recidivism

[C.V.](#) | [Website](#) | eaweber@bu.edu

References: [Kevin Lang](#), [Daniele Paserman](#), [James Feigenbaum](#)

Dongwei Xu



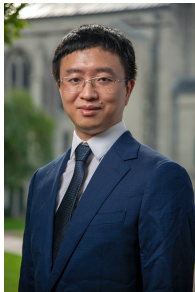
Fields: Macroeconomics, Asset Pricing, International Economics

Job Market Paper: Labor Adjustment Cost: Implications for Asset Prices

[C.V.](#) | [Website](#) | xud@bu.edu

References: [Marianne Baxter](#), [Stephen Terry](#), [Andrea Vedolin](#)

Guang Zhang



Fields: Econometrics, Empirical Finance

Job Market Paper: Quasi Monte Carlo Kalman Filter for Nonlinear and Non-Gaussian State Space Models

[C.V.](#) | [Website](#) | gzhang46@bu.edu

References: [Zhongjun Qu](#), [Pierre Perron](#), [Jean-Jacques Forneron](#)

Nan Zhao



Fields: Microeconomic Theory, Contract Theory

Job Market Paper: Dynamic Incentive Provision When Evaluation Takes Time

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References: [Bart Lipman](#), [Juan Ortner](#), [Chiara Margaria](#)

Xiaoxi Zhao



Fields: Health Economics, Industrial Organization

Job Market Paper: The Effect of Medical Loss Ratio Regulation on Insurers' Pricing

C.V. | [Website](#) | xiaoxiz@bu.edu

References: [Randall Ellis](#), [Marc Rysman](#), [Leila Agha](#), [Christopher Whaley](#)

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Sort by: [Name](#), [Field](#)

Development Economics	Macroeconomics
Thomas Gautier	Enkhjargal Lkhagvajav
Lisa Tarquinio	Julio Ortiz
Econometrics	Zhouxiang Shen
Undral Byambadalai	Dongwei Xu
Taosong Deng	Yang Ming
Anlong Qin	Microeconomic Theory
Guang Zhang	Lester Chan
Health Economics	Pablo Cuellar Tapia
Sophia Ying Liu	Fernando Payro Chew
Chenlu Song	Nan Zhao
Xiaoxi Zhao	Political Economy
Industrial Organization	Cheonghum Park
Shuang Wang	Public Economics
Youming Liu	Silvia Vannutelli
Labor Economics	
Gerard Domenech Arumi	
Anna Weber	

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EDUCATION

Ph.D., Economics, Boston University, Boston, MA, May 2021 (expected)
Dissertation Title: *Essays on the Econometric Analysis of Welfare and Preferences*
Dissertation Committee: Hiroaki Kaido, Iván Fernández-Val, Ching-to Albert Ma and Jean-Jacques Forneron

B., Commerce and Management, Hitotsubashi University, Tokyo, Japan, 2014

FIELDS OF INTEREST

Econometrics, Applied Microeconomics

WORKING PAPERS

“Identification and Inference for Welfare Gains without Unconfoundedness,” September 2020, Job Market Paper
“Changing Preferences: An Experiment and Estimation of Market-Incentive Effects on Altruism,” (with Ching-to Albert Ma and Daniel Wiesen), June 2020, submitted

WORK IN PROGRESS

“Guaranteed Welfare Maximization for Treatment Choice”

PRESENTATIONS

The European Economic Association Annual Congress, August 2020
The Econometric Society/Bocconi University World Congress, August 2020
BU-BC Joint Workshop in Econometrics, Boston, MA, November 2019

FELLOWSHIPS AND AWARDS

Research Grant, Institute for Economic Development, Boston University, 2017
Japanese Government Scholarship for Undergraduate Studies, 2009-2014
Academic Achievement Award, Hitotsubashi University, 2013

WORK EXPERIENCE

Research Assistant for Hiroaki Kaido, Boston University, Fall 2017-Present
Research Assistant for Pierre Perron, Boston University, Summer 2019

TEACHING EXPERIENCE

Instructor, Introductory Microeconomic Analysis, Boston University, Summer 2018
Teaching Fellow, Introductory Microeconomic Analysis, Boston University, Fall 2015-Spring 2017
Teaching Assistant, Advanced Microeconomics (M.A. level), Hitotsubashi University, Spring 2014

LANGUAGES

English (fluent), Japanese (fluent), Mongolian (native), French (beginner)

COMPUTER SKILLS: MATLAB, Python, R, Stata

CITIZENSHIP/VISA STATUS: Mongolia/F1

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Professor Jean-Jacques Forneron

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Identification and Inference for Welfare Gains without Unconfoundedness (Job Market Paper)

This paper studies identification and inference of the welfare gain that results from switching from one policy (such as the status quo policy) to another policy. The welfare gain is not point identified in general when data are obtained from an observational study or a randomized experiment with imperfect compliance. I characterize the sharp identified region of the welfare gain and obtain bounds under various assumptions on the unobservables with and without instrumental variables. Estimation and inference of the lower and upper bounds are conducted using orthogonalized moment conditions to deal with the presence of infinite-dimensional nuisance parameters. I illustrate the analysis by considering hypothetical policies of assigning individuals to job training programs using experimental data from the National Job Training Partnership Act Study. Monte Carlo simulations are conducted to assess the finite sample performance of the estimators.

Changing Preferences: An Experiment and Estimation of Market-Incentive Effects on Altruism (*with Ching-to Albert Ma and Daniel Wiesen*)

This paper studies how altruistic preferences are changed by markets and incentives. We conduct a laboratory experiment in a within-subject design. Subjects are asked to choose health care qualities for hypothetical patients in monopoly, duopoly, and quadropoly. Prices, costs, and patient benefits are experimental incentive parameters. In monopoly, subjects choose quality to tradeoff between profits and altruistic patient benefits. In duopoly and quadropoly, we model subjects playing a simultaneous-move game. Each subject is uncertain about an opponent's altruism, and competes for patients by choosing qualities. Bayes-Nash equilibria describe subjects' quality decisions as functions of altruism. Using a nonparametric method, we estimate the population altruism distributions from Bayes-Nash equilibrium qualities in different markets and incentive configurations. Markets tend to reduce altruism, although duopoly and quadropoly equilibrium qualities are much higher than those in monopoly. Although markets crowd out altruism, the disciplinary powers of market competition are stronger. Counterfactuals confirm markets change preferences.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Economic Applications of Potential Games*

Dissertation Committee: Ching-to Albert Ma, Barton Lipman, and Alexander White

M.Phil., Economics, Chinese University of Hong Kong (CUHK), Hong Kong, 2015

Main Advisor: Duoche Li

B.Sc., Quantitative Finance and Risk Management Science, CUHK, Hong Kong, 2013

First Class Honors

FIELDS OF INTEREST

Microeconomic Theory, Industrial Organization

WORKING PAPERS

“[Weight-Ranked Divide-and-Conquer Contracts](#),” September 2020. (Job Market Paper)

“[Divide and Conquer in Two-Sided Markets: A Potential-Game Approach](#),” revise and resubmit at *RAND Journal of Economics*.

WORK IN PROGRESS

“Signed Weighted Potential Games and Potential Minimaximization: Application to Multi-Agent Contracting”

“Strong Network Effects Eliminate Spence Distortions”

PRESENTATIONS

World Congress of the Game Theory Society, Budapest, Hungary, 2021 (scheduled)

University of Manchester Economic Theory Seminar, 2020 (scheduled)

CUHK-HKU-HKUST Joint Theory Seminar, 2020

Young Economists Symposium, 2020

Toulouse School of Economics Online Economics of Platforms Seminar, 2020

Annual Conference of the European Association for Research in Industrial Economics, Barcelona, Spain, 2019

Platform Strategy Research Symposium, Boston MA, 2019

North American Summer Meeting of the Econometric Society, Seattle WA, 2019

Asian Meeting of the Econometric Society, Xiamen, China, 2019

International Industrial Organization Conference, Boston MA, 2019

FELLOWSHIPS AND AWARDS

Dean’s Fellowship, Boston University, 2015 – 2020

Summer Research Grant, Boston University, 2018 – 2019

Postgraduate Fellowship, CUHK, 2013 – 2015

Best Thesis Award, CUHK, 2015

Highest Grade Point Average Award, CUHK, 2014
Dean's List, CUHK, 2011, 2013

WORK EXPERIENCE

Research Assistant for Duozhe Li, CUHK, Fall 2014 – Spring 2015, Summer 2015 – 2018
Research Assistant for Travis Ng, CUHK, Summer 2017

REFEREE EXPERIENCE

Economic Modelling, Management Science, The B.E. Journal of Theoretical Economics

TEACHING EXPERIENCE

Teaching Assistant, Microeconomic Theory, Boston University, Fall 2017 – Spring 2020
Teaching Assistant, Health Economics, Boston University, Spring 2017, 2020
Teaching Assistant, Introduction to Microeconomics, Boston University, Fall 2016
Teaching Assistant, Game Theory, CUHK, Spring 2014
Teaching Assistant, Advanced Microeconomics, CUHK, Fall 2013

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Weight-Ranked Divide-and-Conquer Contracts (Job Market Paper)

This paper studies a large class of multi-agent bilateral contracting models with the property that agents' payoffs constitute a weighted potential game. I fully characterize a contracting scheme that is optimal for a large set of equilibrium selection criteria and implementation requirements. This scheme ranks agents in ascending order of their weights in the weighted potential game and induces them to accept their offers in a dominance-solvable way, starting from the first agent. I apply the general results to networks and pure/impure public goods/bads.

Divide and Conquer in Two-Sided Markets: A Potential-Game Approach

Strong network effects generate multiple equilibria in two-sided markets. To overcome the methodological challenge of selecting an appropriate equilibrium, this paper shows that many two-sided market models are weighted potential games, and thus potential maximization, a refinement of Nash equilibrium justified by many theoretical and experimental studies, always selects a unique equilibrium. Under potential maximization, platforms often subsidize one side and charge the other, i.e., divide and conquer. The fundamental determinant of which side to subsidize/monetize is cross-side network effects. This divide-and-conquer strategy implies that platforms are often designed to favor the money side much more than the subsidy side.

Signed Weighted Potential Games and Potential Minimaximization: Application to Multi-Agent Contracting

This paper introduces signed weighted potential games and potential minimaximization. The former generalize weighted potential games by allowing negative weights, and they are strategically equivalent to two-team zero-sum games. The latter selects the global saddle point of the potential function, and it reduces to potential maximization if all the weights are positive. Based on these generalizations, I extend the main result of Chan (2020) on multi-agent contracting. Precisely, in a more general contracting environment, the weight-ranked divide-and-conquer contracts, in a generalized form, remain optimal for a large set of implementation requirements.

Strong Network Effects Eliminate Spence Distortions

Under strong network effects with multiple tipping equilibria, firms compete for the adoption of all consumers instead of competing for the marginal consumer. In this scenario, the Spence distortion should be absent, contradicting the well-established Spence distortion results in the network economics literature. The crux of this inconsistency is the choice of equilibrium selection criterion. This paper shows that all popular selection criteria in that literature lead to Spence distortions whereas a refinement of Nash equilibrium justified by many theoretical and experimental studies—potential maximization—does not. This suggests that regulations on network markets based on Spence distortion arguments might be socially suboptimal or even welfare-reducing.

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EDUCATION

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M.A. Political Economy, Boston University, Boston MA, 2019

M.A. Applied Economics, Universidad de Chile, Santiago, Chile, 2014

B.S. Industrial Engineering, Universidad de Chile, Santiago, Chile, 2012

FIELDS OF INTEREST

Applied Microeconomic Theory, Law and Economics

WORKING PAPERS

“Voluntary Disclosure of Evidence in Plea Bargaining,” September 2020. Job Market Paper.

“Venture Capital contracts under Disagreement,” June 2020.

“Bargaining over an Endogenous Surplus,” June 2020.

WORK IN PROGRESS

“Delegation and Learning”

“Knowledge Transfer among Agents”

PRESENTATIONS

6th World Congress of the Game Theory Society, Budapest, Hungary, 2021 (scheduled)

30th International Conference on Game Theory, Stony Brook University, 2019

52nd Annual Conference of the Canadian Economics Association, Montreal, Canada, 2018

FELLOWSHIPS AND AWARDS

Research Grant, Institute for Economic Development, Summer 2018

Graduate Scholarship, Boston University, 2015 - 2020

Master Scholarship, Chilean Government Conicyt, 2013 - 2014

WORK EXPERIENCE

Risk Analyst, BCI, Santiago, Chile, March 2015 - July 2015

Summer Intern, Fundación Sol, Santiago, Chile, Summer 2014

Summer Intern, Consorcio Seguros, Santiago, Chile, Summer 2013

TEACHING EXPERIENCE

Instructor, Legal Issues in Economics, Department of Economics, Boston University,
Summer 2019

Teaching Fellow, Introductory Microeconomic Analysis, Department of Economics, Boston
University, Fall 2016

Teaching Fellow, Microeconomics I (master level), Department of Industrial Engineering,
Universidad de Chile, Fall 2013
Teaching Fellow, Microeconomics II (master level), Department of Industrial Engineering,
Universidad de Chile, Spring 2013
Teaching Fellow, Advanced Microeconomics (master level), Department of Industrial
Engineering, Universidad de Chile, Spring 2012 and Spring 2013
Teaching Fellow, Industrial Organization, Department of Industrial Engineering, Universidad
de Chile, Fall 2012 and Spring 2012
Teaching Fellow, Microeconomics, Department of Industrial Engineering, Universidad de
Chile, Spring 2012

LANGUAGES

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COMPUTER SKILLS

MATLAB, Python, Java, LaTeX

CITIZENSHIP/VISA STATUS

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PABLO CUELLAR

Voluntary Disclosure of Evidence in Plea (Job Market Paper)

I study how voluntary disclosure of new information affects outcomes in plea bargaining. A prosecutor negotiates a sentence with a defendant, who is privately informed whether he is guilty or innocent. The prosecutor investigates for evidence about the defendant's type during the negotiation. If they fail to reach an agreement before the costly trial, payoffs are assigned depending on the evidence. Voluntary disclosure gives rise to endogenous second order uncertainty. Even though the prosecutor is purely motivated to get a high sentence, she might disclose exculpatory evidence. Voluntary disclosure leads to inefficient outcomes; they might fail to reach an agreement before trial. Mandatory disclosure is socially preferable: they always reach an agreement before the trial. Moreover, the prosecutor is better off under mandatory disclosure. The defendant is also better off if he is innocent and worse off if he is guilty.

Venture Capital Contracts under Disagreement

I study how disagreement about noncontractible future decisions affects the optimal investment contract between an entrepreneur and a venture capitalist. The investment contract is incomplete, but it specifies control right and cash-flow rights for each party. The control rights are valuable because both parties openly disagree about the optimal future decisions. The optimal contract differs depending on which party offers it; when the entrepreneur offers it, he relinquishes control rights for high values of the required investment, and in general, more disagreement makes him less likely to keep the control rights. The entrepreneur is better off with more disagreement if either the required investment is low enough, or high enough. If the venture capitalist offers the contract she always keeps the control rights.

Bargaining over an Endogenous Surplus

I study a bargaining model between two players with endogenous probability of recognition and endogenous surplus. At each period they can make two types of effort: productive effort, that increases the surplus; and unproductive effort, that affects the probability of being recognized as proposer. With convex effort cost players increase the surplus for some periods before ending the game. I characterize how comparative advantages of each player affect the effort decisions over time. I show that comparative advantages in the unproductive effort affect the provision of both types of effort. But advantages in the productive effort only affect the effort decision of the productive effort. Different time preferences only affect the productive efforts if the probability of recognition is not persistent, and both type of efforts if it is persistent.

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EDUCATION

Ph.D. in Economics, Boston University, Boston MA, 2021 (expected)
Dissertation Title: *Econometric Essays on Return Predictive Regressions and Nonlinear Dynamic Stochastic General Equilibrium Models*
Dissertation Committee: Zhongjun Qu, Pierre Perron, and Jean-Jacques Forneron

M.A. Student in Statistics, Boston University, Boston MA, 2014
M.A. in Economics, Boston University, Boston MA, 2013
B.A. in Economics, Hunan University, Changsha, China, 2012

FIELDS OF INTEREST

Primary Fields: Econometrics

Secondary Fields: Quantitative Macroeconomics, Empirical Finance

WORKING PAPERS

"Inference in Predictive Regressions with Persistent Predictors" (Job Market Paper 1),
September 2020

"A New Particle Filter for Nonlinear Dynamic Stochastic General Equilibrium Models" (Job
Market Paper 2), (with Zhongjun Qu),
September 2020

"Theory of Low-Frequency Contamination from Nonstationarity and/or Misspecification:
Consequences for HAR Inference", (with Alessandro Casini and Pierre Perron),
September 2020

WORKING IN PROGRESS

"Images of Countries: A Cross-National Comparison of Media Coverage during the Covid-19
Pandemic", (with Meng Wu)

"Option Pricing Implications of Learning"

PRESENTATIONS

BU Econometrics Seminar, Boston, MA, Fall 2020
BU Econometrics Seminar, Boston, MA, Spring 2020
BU Econometrics Seminar, Boston, MA, Spring 2019
BU Econometrics Seminar, Boston, MA, Spring 2018
BU Econometrics Seminar, Boston, MA, Fall 2016

WORK EXPERIENCE

Research Assistant for Prof. Pierre Perron, Boston University, Spring 2020
Research Assistant for Prof. Marianne Baxter, Boston University, Fall 2019
Research Assistant for Prof. Pierre Perron, Boston University, Spring 2019
Research Assistant for Prof. Zhongjun Qu, Boston University, Spring 2018 - Fall 2018
Research Assistant for Prof. Pierre Perron, Boston University, Fall 2015 - Fall 2017

RESEARCH GRANTS

Summer Research Grant, Department of Economics, Boston University, Summer 2018

FELLOWSHIPS AND AWARDS

Doctoral Research Fellowship, Boston University, Fall 2015 - Spring 2020
Dean's Fellowship, Boston University, Fall 2014 - Spring 2015

LANGUAGES: English (fluent), Chinese (native)

COMPUTER SKILLS: MATLAB, R, Python, GAUSS, Stata, Mathematica, C/C++, LaTeX

CITIZENSHIP/VISA STATUS: China/F1

DATE OF BIRTH: October 19, 1990

REFERENCES

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Inference in Predictive Regressions with Persistent Predictors (Job Market Paper 1)

Conventional tests of predictive regressions exhibit substantial size distortions. Existing valid inference procedures such as those of Stambaugh (1999), Amihud and Hurvich (2004), Lewellen (2004), and Campbell and Yogo (2006), all require multiple steps for their implementation. In this paper, I propose a simple procedure using an augmented regression that requires only one step to test the coefficients in a predictive regression with a nearly integrated predictor. Using the local-to-unity asymptotics, I show that the limiting distribution of the t-statistic on the parameter of predictability is the same as that in Lewellen (2004). Therefore, the usual t-statistic using the conventional standard normal critical values is conservative. Also, the limiting distribution of the t-statistic on the parameter capturing the correlation between the innovations is standard normally distributed, asymptotically independent of the unknown degree of persistence of the predictor. In order to address the situation where the predictive test is uninformative because of possible outlying events or regime changes, I propose a class of robust tests and study their asymptotic properties. In the empirical application, I find considerable evidence of the predictability of NYSE/AMEX returns using nearly integrated predictors such as the log dividend-price ratio or the log earning-price ratio. Particularly, the proposed t-test produced by the augmented regression yields similar results to those of Campbell and Yogo's (2006) popular Q-test.

A New Particle Filter for Nonlinear Dynamic Stochastic General Equilibrium Models (Job Market Paper 2) (with Zhongjun Qu)

There is an increasing demand for filters applicable to nonlinear dynamic stochastic general equilibrium (DSGE) models. One of the popular choices is the particle filter. However, it is well known that this filter requires adding measurement errors to the measurement equation for its implementation. Otherwise, singularity arises, and consequently, the algorithm breaks down. Measurement errors are not a common feature of DSGE models. Motivated by this limitation, in this chapter, we develop a new particle filter by classifying the state variables into two groups: states that contribute to the observables and states that do not. By only sampling and propagating particles of unobservable states, no measurement error is needed. For implementation, we propose two approaches to compute the observables' density conditional on the second set of states. The first is a local approximation approach based on kernel density smoothing, and the second is a global approximation approach based on series expansions. As an important feature, the new filter also allows us to study singular DSGE models using the composite likelihood, therefore providing a unified treatment of both singular and nonlinear DSGE models. We illustrate the new filter using both actual and simulated data for several DSGE models.

Theory of Low Frequency Contamination from Nonstationarity and Misspecification: Consequences for HAR Inference (with Alessandro Casini and Pierre Perron)

We establish theoretical results on the low frequency contamination induced by general nonstationarity for estimates such as the sample autocovariance and the periodogram. We show that for short memory nonstationarity data these estimates exhibit features that correspond to long memory. We present explicit expressions for the asymptotic bias of these estimates. This bias increases with the degree of heterogeneity. The sample autocovariances display hyperbolic decay rather than exponential decay while the periodogram becomes unbounded around the origin. We distinguish cases where this contamination only occurs as a small-sample problem and cases where the contamination continues to hold asymptotically. We show theoretically that nonparametric smoothing over time is robust to low frequency contamination in that the sample local autocovariance and the local periodogram are unlikely to exhibit long memory features. Simulations confirm that our theory provides excellent approximations. Since the autocovariances and the periodogram are key elements for heteroskedasticity and autocorrelation robust (HAR) inference, our results provide new insights on the debate between consistent versus inconsistent long-run variance estimation. Existing long-run variance estimators tend to be inflated when the data are nonstationary. This results in HAR tests that can exhibit dramatic size distortions and power losses or even no power. These issues can potentially arise in most of the HAR inference contexts in econometrics. Our theory indicates that long bandwidths or fixed-b HAR tests suffer more from low frequency contamination relative to HAR tests based on HAC estimators, whereas recently introduced double kernel HAC estimators do not suffer from this problem. A simulation study supports such theoretical results.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, 2021 (expected)

Dissertation Title: *Three Essays on Empirical Microeconomics*

Dissertation Committee: M. Daniele Paserman, Raymond Fisman and Johannes Schmieder

M.A., Political Economy, Boston University, Boston, MA, 2018

M.A., Economics and Finance, CEMFI, Madrid, Spain, 2015

B.A., Economics (*Summa Cum Laude*), Universitat Autònoma de Barcelona, Cerdanyola del Vallès, Spain, 2013

FIELDS OF INTEREST

Labor Economics, Public Economics, Political Economy

WORKING PAPERS

(Job Market Paper) “Neighborhoods, Perceived Inequality, and Preferences for Redistribution: Evidence from Barcelona”, October 2020

“Bringing Them In or Pushing Them Out? The Labor Market Effects of Pro-cyclical Unemployment Assistance Reductions,” (with Silvia Vannutelli), July 2020

WORK IN PROGRESS

“Neighborhoods, Perceptions, and Preferences for Redistribution: Social Mobility and Immigration”

“The Dynamic Effects of Immigration on Electoral Outcomes,” (with Cheonghum Park)

PRESENTATIONS

The Tobin Project Inequality and Decision-Making Graduate Student Workshop, Cambridge, MA, 2020 (scheduled)

5th International EALE/SOLE/AASLE Conference, Berlin, Germany, 2020

31st EALE Conference, Uppsala, Sweden, 2019

Barcelona GSE Summer Forum, Barcelona, Spain, 2019

IEB Workshop on the Economics of Taxation & Social Expenditure, Barcelona, 2019

IAB Welfare and Unemployment Dynamics Workshop, Nuremberg, Germany, 2018

FELLOWSHIPS AND AWARDS

Graduate Research Fellowship, The Tobin Project, 2020

Abdala Research Fellowship, Institute for Economic Development, 2020

Gitner Prize for Outstanding Economics Teaching Fellow, Boston University: Department of Economics, 2020

Research and Teaching Assistant Fellowship, Boston University: Department of Economics, 2017-20

Grant for Summer Research, the Institute for Human Studies, 2017

“la Caixa” Fellowship, Fundació Bancaria “la Caixa”, 2015-17

CEMFI Fellowship for Graduate Studies, CEMFI, 2013-15

Extraordinary Prize of Bachelor, Universitat Autònoma de Barcelona, 2013

ACADEMIC WORK EXPERIENCE

Research Assistant for Prof. Daniele Paserman, Boston University, January 2017 to December 2018 & September 2020 to present

Research Assistant for Prof. Claudia Steinwender, MIT Sloan, September 2017 to August 2018

Research Assistant for Prof. Marcos Vera, Institute for Fiscal Studies, June & July 2014

Research Assistant for Prof. Pedro Rey, Universitat Autònoma de Barcelona, June to August 2013

NON-ACADEMIC WORK EXPERIENCE

Finance Assistant, Nestlé UK & I, September to December 2012

Accounts Receivable Assistant, Nestlé UK & I, January to April 2012

REFeree EXPERIENCE

Review of Economics and Statistics, Hacienda Pública Española/Review of Public Economics

TEACHING EXPERIENCE

Teaching Fellow, Empirical Microeconomics II, Boston University: Department of Economics, Summer 2020

Teaching Assistant, Intermediate Macroeconomics, Boston University: Department of Economics, Summer 2020

Head Teaching Fellow, Introductory Microeconomics, Boston University: Department of Economics, Fall 2019 & Spring 2020

Facilitator, Introductory Microeconomics, Boston University: Department of Economics, Summer 2019

Teaching Fellow, Introductory Microeconomics, Boston University: Department of Economics, Spring 2019

LANGUAGES: English (fluent), Catalan (native), Spanish (native), French (elementary), Portuguese (elementary)

COMPUTER SKILLS: STATA, R, QGIS, MATLAB, LaTeX

CITIZENSHIP/VISA STATUS: Spain/J1

REFERENCES

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GERARD DOMÈNECH-ARUMÍ

Neighborhoods, Perceived Inequality, and Preferences for Redistribution: Evidence from Barcelona (Job Market Paper)

This paper combines various data sources and identification strategies to investigate whether neighborhoods are drivers of perceived inequality and preferences for redistribution. It first proposes a novel measure of local inequality, the Local Neighborhood Gini (LNG). The LNG is based on the spatial distribution of dwellings within a city, independent of preexisting administrative boundaries, and specific to *each* city's building. Secondly, it elicits perceptions and demand for redistribution from a large-scale survey conducted in Barcelona (Spain). Critically, the survey linked responses to participants' specific LNG through their home addresses. Finally, the paper exploits a within-survey experiment and the recent rise of new apartment buildings close to respondents' dwellings as an outside-the-survey quasi-experiment to identify the effects of neighborhoods on perceived inequality and preferences for redistribution. Results suggest that individuals living in more unequal local environments are more likely to perceive higher inequality, but only moderately more prone to demand more redistribution – with ideology playing a key role in the overall story. This paper's contribution falls within the growing strand of research exploring the causes and consequences of misperceptions.

Bringing Them In or Pushing Them Out? The Labor Market Effects of Pro-cyclical Unemployment Assistance Reductions (with Silvia Vannutelli)

We causally estimate the effects of pro-cyclical unemployment-assistance (UA) reductions on job search behavior and re-employment outcomes using reform-induced changes in UA durations for older workers in Spain. Benefit reductions are effective in bringing workers back to work and reduce non-employment duration, but also induce displacements out of the labor force and strong substitution patterns towards less generous UA programs, highlighting the social insurance role of long-term benefits during economic downturns. Despite the sharp drop in non-employment duration, we also document a large decrease in re-employment wages, consistent with a reduction in workers' reservation wages and limited duration dependence.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Essays in Development Economics*

Dissertation Committee: Samuel Bazzi, Dilip Mookherjee, and Daniele Paserman

M.A., Economics, Université Catholique de Louvain, Belgium, and Université Paris 1 Panthéon-Sorbonne, France (dual degree), 2015

B.A., Economics and Management, Université Catholique de Louvain, Belgium, 2013

FIELDS OF INTEREST

Development Economics, Political Economy

WORKING PAPERS

“Refugee Settlement and Social Integration: Evidence from Turkey,” October 2020. [Job Market Paper].

“The Long-Run Impact of Losing Siblings During a Genocide: Evidence from Rwanda,” August 2020.

WORK IN PROGRESS

“Local Public Goods and the Rise of Islamic Parties: Evidence from Turkey” (joint with Bilge Erten, Gedeon Lim, Erik Meyersson, and Yunus Cem Yilmaz)

“Can I get that in writing? Lessons from a Contracting Field Experiment in Urban Malawi” (joint with Mahesh Karra)

PRESENTATIONS

Households in Conflict Network Workshop, 2020. (scheduled)

Virtual Meeting of the Urban Economics Association, 2020. (scheduled)

NBER Dev Pre-Conference Meeting, Cambridge, MA, 2020.

Econometric Society’s World Congress, Milan, Italy, 2020.

Midwest International Economic Development Conference, Lafayette, IN, 2020.

Human Capital Initiative, Boston University, Boston, MA, 2019.

CREST Workshop, Namur, Belgium, 2019.

EUDN Workshop, Leuven, Belgium, 2019.

LICOS Seminar, Leuven, Belgium, 2019.

FELLOWSHIPS AND AWARDS

Funding for Research Assistant, Boston University, Spring and Summer 2020

Manuel Abdala Grant, Boston University, Spring 2020

Funding for Research Assistant, Boston University, Spring 2019

Manuel Abdala Grant, Spring 2019 (joint with Thomas Pearson)

IED Research grant, Boston University, Spring 2019 (joint with Thomas Pearson)
Teaching Fellowship, Boston University, 2016-2020
Dean's Fellowship, Boston University, 2015-2016
Study Grant, Fédération Wallonie-Bruxelles, 2013-2014

WORK EXPERIENCE

Consultant, World Bank (Summer 2020 - present)

TEACHING EXPERIENCE

Teaching Fellow – Principles of Economics (Fall 2018 – Spring 2020)

LANGUAGES

French (native), English (fluent), Dutch (intermediate).

COMPUTER SKILLS: Python, R, Stata, ArcGIS, LaTeX.

CITIZENSHIP/VISA STATUS: Belgium/F1

REFERENCES

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THOMAS GAUTIER

Refugee Settlement and Social Integration: Evidence from Turkey (Job Market Paper)

How do networks of immigrants influence the social integration of their members into the host community? Using mobile phone data collected from Syrian refugees living in Turkey, I document that refugees tend to make significantly more phone calls with locals as well as other refugees in villages with more refugees. I argue that this relationship is likely causal by using a distance-based instrumental variable strategy. The positive effect of refugee networks on social integration is more important when the concentration of refugees is low, and when the cultural gap between refugees and locals is wider. I argue that my results are consistent with the hypothesis that immigrant networks make it easier for refugees to interact with locals, by sharing information on local norms and creating new opportunities to meet locals. Refugees who do not have access to a large refugee-network find it difficult to identify which locals they should interact with, and will, therefore, be more isolated. My results suggest that countries hosting refugees should make sure that refugees are not physically isolated from individuals with whom they could share their experiences.

The Long-Run Impact of Losing Siblings During a Genocide: Evidence from Rwanda

In this paper, I investigate how civil conflicts can have long-run effects on human capital by modifying family structures. More precisely, I study the impact of losing a sibling during the 1994 genocide against Tutsis in Rwanda on the education of surviving children. Using the age and sex profile of their siblings to generate plausible exogenous variation in the number of brothers and sisters who passed away in 1994, I show that the loss of a sibling leads to positive effects on human capital, but to negative effects on wealth. I argue that these results are consistent with standard models of fertility choice, although other mechanisms could play an important role. Parents who lose a child have the choice between two main coping strategies: replacing the lost child, or increasing their investments in the human capital of the surviving children. When the cost of having an additional child is relatively low, parents decide to have more children after 1994, the increase in education for the surviving children is smaller, and the negative effects on wealth for the surviving children are larger. On the other hand, when the cost of having an additional child is high, the replacement effect and the negative impact on wealth are smaller, while the positive effect on education is larger.

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EDUCATION

Ph.D., Economics, Boston University, Boston, MA, May 2021 (expected)

Dissertation Title: *Essays on Health and Human Capital Development*

Dissertation Committee: Robert Margo, Daniele Paserman, Randall Ellis

M.A., Economics, Boston University, Boston, MA, 2016

B.S., Business Administration, University of California Riverside, Riverside, CA

(*Magna Cum Laude*), 2010

FIELDS OF INTEREST

Health Economics, Economic History, Empirical Microeconomics

PUBLICATION

[“Diagnostic Category Prevalence in 3 Classification Systems Across the Transition to the International Classification of Diseases, Tenth Revision, Clinical Modification”](#)

Randall P. Ellis, Heather E. Hsu, Chenlu Song, Tzu-Chun Kuo, Bruno Martins, Jeffrey J. Siracuse, Ying Liu (Sophia), Arlene S. Ash *JAMA Network Open*, 3.4 (2020): e202280-e202280.

WORKING PAPERS

[“Re- evaluating the Effects of the 1918 Influenza Pandemic on Human Capital Development: The Role of the Great Depression”](#), Ying Liu (Sophia), Job Market Paper.

WORK IN PROGRESS

“Is Intergenerational Transmission of Human Capital One-way? Evidence from Civil War Veterans and Their Children”, Ying Liu (Sophia)

“Modeling school openings, vacations, and closings to understand disease patterns
Danrong Chen, Ying Liu (Sophia), Alex Hoagland, Sarah L Ma, Yuhang Chen, Maxim Slobodchikov, and Randall P. Ellis

“Diagnostic Items: A New Framework for Disease Surveillance, Prediction and Risk Adjustment” (Randall P Ellis, Corinne Andriola, Arlene S Ash, Heather E Hsu, Brian C Jacobson, Tzu-Chun Kuo, Karen Lasser, Ying Liu (Sophia), Jeffrey Siracuse, Chenlu Song, Allan Walkey

PRESENTATIONS

National Bureau of Economic Research (NBER), Vienna, VA, 2016
Harvard University Graduate Student Workshop in Economic History, Boston, MA 2020
Economic History Association, Young Scholars Initiative (YSI), 2020

WORK EXPERIENCE

Researcher, National Bureau of Economic Research, Summer 2016
Research Assistant for Randall Ellis, Department of Economics, Boston University, 2018-2020
Research Assistant for Melissa McInerney, Department of Economics, Tufts University, Summer 2018
Research Assistant for Robert Margo, Department of Economics, Boston University, 2015-2016
Cost Analyst, Able Card LLC, Azusa, CA, 2014-2016

TEACHING EXPERIENCE

Teaching Assistant, Principles of Microeconomics, Department of Economics, Boston University, 2017 and 2020
Teaching Assistant, Managerial Economics, Questrom School of Business, Boston University, 2018-2020

PROFESSIONAL ACTIVITIES

Organizer, Health Economics Reading Group, Department of Economics, Boston University, 2018

COMPUTER SKILLS: R, STATA, Python, SAS, ArcGIS, LaTeX

CITIZENSHIP/VISA STATUS: USA

REFERENCES

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Professor Randall P. Ellis

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Professor Jay Zagorsky

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YING LIU (SOPHIA)

Re-evaluating the Effects of the 1918 Influenza Pandemic on Human Capital Development: The Role of the Great Depression (Job Market Paper)

This paper examines the effects of the 1918 Influenza Pandemic and the Great Depression on an individual's educational attainments and labor market outcomes. I build a new dataset of county-level influenza mortality from 1918 to 1920 and combine with various Great Depression measures to document their effects. These measures are combined with a newly assembled dataset linking census data on childhood household characteristics to adult outcomes from military records. I estimate the interactive effects of the Great Depression and the pandemic exposure, utilizing their wide geographic variations. This paper finds that the Great Depression mitigates the effects on the Pandemic on the flu birth cohorts, leading to higher educational attainments. These results suggest that without the Great Depression, the influenza birth cohorts would have even lower human capital investments and worse labor market outcomes.

Is Intergenerational Transmission of Human Capital One-way? Evidence from Civil War Veterans and Their Children

Existing literature on intergenerational transmission of human capital usually take the top-down approach - study the relationship from parents to their descendants. This paper takes a backward approach and studies the effects of children's education on their parents' human capital. Using the exogenous variations in the Compulsory Attendance Laws, Child Labor Laws and Continuation Schooling Laws in different states from 1880 to 1930, this paper finds higher children's education increases parents' longevity and lowers their mortality from specific chronic diseases among the American Civil War veterans and their spouses.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, August 2019
Dissertation Title: *Regulation and Welfare Efficiency: Evidence from China*
Main advisor: Marc Rysman
M.S., Economics, Boston University, Boston MA, 2014
B.A., Zhejiang Gongshang University, Hangzhou, Zhejiang, China, 2012

CURRENT AFFILIATION

Post-Doctoral Research Associate, Cornell Institute for China Economic Research, Cornell University, August 2019 – Present

FIELDS OF INTEREST

Industrial Organization, Environmental Economics, Chinese Economy

JOB MARKET PAPER

“Competition for Exclusivity and Customer Lock-in: Evidence from Copyright Enforcement in China,” August 2020.

SUBMITTED PAPERS

“The Dynamic Efficiency in Resource Allocation: Evidence from Vehicle License Lotteries in Beijing,” (with Shanjun Li and Caixia Shen) *Revise and Resubmit at Rand Journal of Economics*.

“The Cost of Greening Stimulus: A Dynamic Discrete Choice Analysis of Vehicle Scrapage Programs,” (with Shanjun Li and Chao Wei) *Revise and Resubmit at International Economic Review*.

WORKING IN PROGRESS

“Quality Upgrading in China’s Automobile Industry (with Panle Jia Barwick and Shanjun Li)

“On the Linkage Between Used Automobile Market Development and New Car Sales (with Panle Jia Barwick and Shanjun Li)

PRESENTATIONS

World Congress of the Econometric Society, August 2020
International Industrial Organization Conference, April 2019
Conference in Industrial Organization, Shanghai University of Finance and Economics, June 2019
Economics Graduate Students Conference, Washington University in St. Louis, October 2018

FELLOWSHIPS AND AWARDS

Dean’s Fellowship, Boston University, 2014-2018
Summer Research Grant, 2017
Special PhD Stipend for MA Graduates, Boston University, 2014

WORK EXPERIENCE

Research Assistant for Marc Rysman, Department of Economics, Boston University, Spring 2017 – Spring 2018

Research Assistant for Zhongjun Qu, Department of Economics, Boston University, Fall 2015

TEACHING EXPERIENCE

Teaching Assistant, Game Theory, Department of Economics, Boston University, Fall 2018 -Spring 2019

Teaching Assistant, Environmental Economics, Department of Economics, Boston University, Fall 2018

Teaching Assistant, Legal Issues, Department of Economics, Boston University, Fall 2016

Teaching Assistant, Market Structure and Economic Performance, Department of Economics, Boston University, Fall 2016

Teaching Assistant, Empirical Economics 2, Department of Economics, Boston University, Spring 2016 - Fall 2016

LANGUAGES

Mandarin Chinese (native), Fluent English

COMPUTER SKILLS:

MATLAB, Stata, Gauss, Python, C, Bash, LaTeX

CITIZENSHIP/VISA STATUS:

China/F1

REFERENCES

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Professor Shanjun Li

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Professor Jihye Jeon

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Competition for Exclusivity and Customer Lock-in: Evidence from Copyright Enforcement in China (Job Market Paper)

Copyright enforcement in China has heightened competition among music streaming services for obtaining exclusive licenses from music labels. The competition is driven by the existence of switching costs for consumers in choosing among services. Exclusivity attracts users for service, benefiting the service in the future when switching costs can be exploited as a lock-in device. This paper estimates switching costs and other key parameters in a dynamic structural model using aggregate data from China's music streaming market over 2014-2017. With the model estimates, I simulate market outcomes that had two alternative policies: a compulsory licensing provision and a mandatory data portability policy been enforced. The counterfactual analysis shows that a compulsory licensing that enforces non-exclusive distribution would increase market concentration, enlarging the market share gap between the leading and small services. However, the analysis suggests using data portability to reduce the switching cost because it attracts more streaming users, benefiting all services in the market.

The Dynamic Efficiency in Resource Allocation: Evidence from Vehicle License Lotteries in Beijing (with Shanjun Li and Caixia Shen)

The efficiency of resource allocation is often analyzed in the static framework with a focus on the cross-sectional heterogeneity among users. When the resource is durable in nature, the temporal heterogeneity among users could be important in comparing different allocation mechanisms such as auctions and lotteries. This paper uses a dynamic model to empirically quantify the dynamic efficiency in resource allocation for durable goods with forward-looking agents. In the context of the vehicle license lottery in Beijing, we find that households on average participate in the lottery system at least four years earlier than they would be in a counterfactual environment of no quantity constraint. Dynamic inefficiency accounts for the majority of welfare loss from the misallocation.

The Cost of Greening Stimulus: A Dynamic Discrete Choice Analysis of Vehicle Scrapage Programs (with Shanjun Li and Chao Wei)

During the great recession, many countries have adopted stimulus programs designed to achieve two goals: to stimulate economic activity in lagging durable goods sectors and to protect or even enhance environmental quality. The environmental benefits are often viewed and much advocated as co-benefits of economic stimulus. This paper investigates the potential tradeoff between the stimulus and environmental objectives in the context of the popular U.S. Cash-for-Clunkers (CFC) program by developing and estimating a dynamic discrete choice model of vehicle ownership. Results from counterfactual analysis show that design elements to achieve environmental benefits could significantly limit the program impact on demand stimulus: the cost of demand stimulus after netting out environmental benefits under the program could be 21 percent higher in terms of vehicle sales and 20 percent higher in terms of consumer spending than that from alternative policy designs without explicitly aiming at the environmental objective. Our findings serve as a cautionary tale for similar green stimulus proposals to address the current economic crisis from the coronavirus pandemic.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Essays on Firm Innovation and R&D*

Main advisor: Stephen J. Terry

M.A., Political Economics, Boston University, Boston MA, 2019

B.S., Economics with Honors and Mathematics (*with Distinction*), University of Michigan,
Ann Arbor MI, 2015

FIELDS OF INTEREST

Macroeconomics, Economic Growth, Economics of Innovation

WORKING PAPERS

“The Effect of Patent Disclosure on Firm Innovation and Growth,” September 2020. [Job
Market Paper]

WORK IN PROGRESS

“Cyclicality of Firms’ Heterogeneous Innovations”

PRESENTATIONS

Boston University Macro Dissertation Workshop, Fall 2018, Fall 2019, Fall 2020

Technology and Policy Research Initiative, Fall 2020 (scheduled)

FELLOWSHIPS AND AWARDS

Graduate Student Fellowship, Boston University, 2015-2020

Mongolian Government Scholarship, Government of Mongolia, 2012-2015

Departmental Putnam Competition Honorable Mention, University of Michigan, Spring 2013

Honorable Mention, International Mathematical Olympiad, 2010

Silver and Bronze Medals, Mongolian National Mathematical Olympiad, 2007-2010

WORK EXPERIENCE

Summer Internship, Monetary Policy Department, Bank of Mongolia, Summer 2017,
Summer 2018

TEACHING EXPERIENCE

Instructor, Intermediate Macroeconomics, Department of Economics, Boston University,
Fall 2020

Instructor, Introductory Macroeconomics, Department of Economics, Boston University,
Summer 2018, Summer 2020

Teaching Fellow, Introductory Macroeconomics, Department of Economics, Boston
University, 2017-2020

September 2020

Teaching Fellow, Introductory Microeconomics, Department of Economics, Boston
University, Fall 2016

LANGUAGES

Fluent in English and Mongolian

COMPUTER SKILLS: R, MATLAB, STATA, LaTeX

CITIZENSHIP/VISA STATUS: Mongolia/F1

REFERENCES

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**Professor Michael J.
Meurer**

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The Effect of Patent Disclosure on Firm Innovation and Growth (Job Market Paper)

A patent system requires innovators to disclose their inventions in return for monopoly rights to their use. This paper shows how patent disclosure policy discourages firms from patenting both empirically and theoretically. I analyze the effect of the American Inventor's Protection Act of 1999 (AIPA), which lowered publication lag for patents filed after 2000. Due to the increasing patent disclosure from the AIPA, U.S. public manufacturing firms experienced a decline in firm innovation rate and patenting intensity. To explain the negative relationship between patent disclosure and firm patenting, I build a Schumpeterian growth model with innovation and patenting treated separately. The model illustrates how patent disclosure can lower patenting at the firm level due to the trade-off between costly disclosure and patent protection. However, the effect of patent disclosure on overall economic growth and knowledge diffusion is non-linear: an appropriate disclosure policy can promote growth, but a strong disclosure policy can hurt them.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Theses on Innovation and Growth*
Main advisor: Christophe Chamley

M.A., Finance, Central University of Finance and Economics, Beijing, China, 2015

B.A., Finance, Hebei University, Baoding, China, 2012

FIELDS OF INTEREST

Macroeconomics, Economics of Innovation, Applied Econometrics

WORKING PAPERS

“Good Dispersion in Bad Times: A Story of R&D Heterogeneity,” September 2020. (Job Market Paper)
“Timing and Quality of Innovation: Evidence from 1986 U.S.-Japan Semiconductor Trade Conflict,” May 2020.
“Circuit Breakers and Market Volatility,” May 2018.

WORK IN PROGRESS

“Heterogeneous Responses of R&D to Destructive Innovations” (joint with Shuowen Chen)
“State Ownership and R&D Efficiency: Evidence from Chinese Public Firms” (joint with Meng Wu)
“Firm Age and Innovation Performance”

PRESENTATIONS

Green Line Macro Meeting, Boston, MA, Fall 2020
Green Line Macro Meeting, Boston, MA, Spring 2020

FELLOWSHIPS AND AWARDS

Excellent Graduate Thesis, Central University of Finance and Economics, 2016
Dean Fellowship, Boston University, 2015
Outstanding Graduate Award of Beijing City, 2015
Excellent Undergraduate Thesis, Hebei University, 2012
Outstanding Graduate Award of Hebei Province, 2012

TEACHING EXPERIENCE

Instructor, Chinese Economy, Boston University, Fall 2019
Instructor, Chinese Economy, Boston University, Fall 2018
Teaching Assistant, International Finance, Boston University, 2018-2020
Teaching Assistant, Empirical Economics, Boston University, Spring 2020

Teaching Assistant, Topics in Monetary Theory and Macroeconomics, Boston University,
Spring 2018

Teaching Assistant, Financial Economics, Boston University, Spring 2017

Teaching Assistant, International Finance Theory, Central University of Finance and
Economics, Spring 2014

LANGUAGES

Chinese (native), English (fluent), Japanese (elementary)

COMPUTER SKILLS: MATLAB, STATA, LaTeX, Python

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REFERENCES

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King**

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Good Dispersion in Bad Times: A Story of R&D Heterogeneity (Job Market Paper)

The paper constructs a theoretical model in which the empirical observation that negative profit shocks increase the industry-level productivity dispersion is generated by heterogeneous responses of R&D to these shocks. Firms with low R&D cost respond by increasing R&D effort to recover the lost profit, while those with high R&D cost respond by reducing R&D effort because a lowered profit means a smaller return to innovation. This mechanism is reproduced by a quantitative model with plausible parameter values and verified by empirical tests. The model also generates a higher productivity growth after negative shocks as documented in the literature. Finally, counterfactual analysis shows that more technology spillover dampens the previous effects.

Timing and Quality of Innovation: Evidence from 1986 U.S.-Japan Semiconductor Trade Conflict

The 1986-1996 U.S.-Japan semiconductor trade conflict served as a natural experiment on the relationship between competition and firm innovation. My empirical findings suggest the rate of returns to R&D of U.S. semiconductor firms increased in response to the removal of the protection over them. Such change could not be explained by returns to scale of R&D investment, and reflected changes in quality of innovation projects. I propose a theory where firms choose from innovation projects with different quality and timing. Temporary protection policy increases domestic firms' market share and markup, leading to higher payoff of innovation in the short-term. This encourages firms to adopt short-term innovation projects, by which they trade innovation quality for timeliness. A few testable implications of this theory is supported by empirical observation.

Circuit Breakers and Market Volatility

As an automatic trade halting mechanism, circuit breaker has ambiguous effect on the volatility of the stock market, which is dependent on the magnitude of the supply shock of asset. The activation of circuit breaker prevents the supply shock from being fully absorbed by the market immediately. It hence generates uncertainty to asset buyers about the size of the shock and thus the execution price of their market orders. As the result, demand can be insufficient when the shock is unexpectedly large, leading to a greater slump than without breakers. Meanwhile, the price and volume upon the halt serve to the asset sellers as signals on the selling pressure, which fuels the fire sale if the pressure is revealed to be high.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Three Essays in Macroeconomics*

Dissertation Committee: Stephen Terry, Adam Guren, and Pascual Restrepo

M.A., Political Economy, Boston University, Boston MA, 2018

B.S., Double Major in Economics and International Affairs (*Summa Cum Laude*), George Washington University, Washington, DC, 2013

FIELDS OF INTEREST

Macroeconomics, Econometrics

NON-REFEREED PUBLICATIONS

“Inflation: Drivers and Dynamics: 2019 CEBRA Annual Meeting Session Summary,” (with Timo Haber, Edward S. Knotek II, Jean-Paul L’Huillier, Damjan Pfajfar, Robert W. Rich, and Raphael Schoenle) *Economic Commentary, Federal Reserve Bank of Cleveland*, (2020) 14: 1-3.

WORKING PAPERS

“[Spread Too Thin: The Impact of Lean Inventories](#),” September 2020. (Job Market Paper)

“[Time-Varying Volatility, Underreaction, and Overreaction](#),” May 2020.

“[A New Fact to Discipline Models of Beliefs](#),” March 2020.

WORK IN PROGRESS

“How Do Market Analysts Form Expectations?”

“Input-Output Inventories and Inflation Dynamics”

PRESENTATIONS

BU-BC Green Line Macro Meeting, Boston, MA, 2019, 2020

BU Macro Dissertation Workshop, Boston, MA, 2017, 2018, 2019, 2020

BU Macro Student Workshop, Boston, MA, 2018, 2019, 2020

GW Forecasting Seminar, Washington, DC, 2020

CEBRA Annual Meeting, New York, NY, 2019

FELLOWSHIPS AND AWARDS

Dean’s Fellowship, Boston University, Fall 2015-Spring 2020

Teaching Fellowship, Boston University, Fall 2016-Fall 2019

WORK EXPERIENCE

Research Assistant, Federal Reserve Board, Washington DC, May 2013-July 2015

TEACHING EXPERIENCE

Instructor, International Trade, Department of Economics, Boston University, Summer 2018
Instructor, Principles of Macroeconomics, Department of Economics, Boston University,
Summer 2019
Instructor, Introduction to Econometrics, Department of Economics, Boston University,
Summer 2020
Teaching Fellow, Econometrics (Masters), Department of Economics, Boston University,
Fall 2017-Spring 2020 (six semesters)
Teaching Fellow, Principles of Macroeconomics, Department of Economics, Boston
University, Fall 2016, Spring 2017, Fall 2019

LANGUAGES

English (native) and Spanish (fluent)

COMPUTER SKILLS: STATA, MATLAB, R, Unix, LaTeX

CITIZENSHIP/VISA STATUS: USA

REFERENCES

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JULIO L. ORTIZ

Spread Too Thin: The Impact of Lean Inventories (Job Market Paper)

Lean production generates a tradeoff between micro stability and macro vulnerability. Examining public “just-in-time” (JIT) firms, I find that JIT producers experience higher sales growth and less volatility. At the same time, JIT producers are more cyclical and sensitive to natural disasters. Motivated by these facts, I build and structurally estimate a general equilibrium model in which heterogeneous firms can adopt JIT. The estimated model implies that while JIT producers enjoy a 1% increase in steady state firm value, an unanticipated disaster akin to the COVID-19 shock results in a 1.6 percentage point sharper output contraction relative to a counterfactual economy with less adoption. With more JIT, previously lean businesses stock out more frequently and hoard now highly valuable materials, disrupting their production processes.

Time-Varying Volatility, Underreaction, and Overreaction

Two seemingly contradictory patterns coexist in data on professional forecasters. After positive news and upward forecast revisions, predictions made by the same person are sometimes systematically too optimistic, “overreacting,” while they are also sometimes predictably too pessimistic, “underreacting.” Making sense of both patterns within the same model proves difficult for a wide range of theories of belief dynamics. But I show that such patterns are to be expected in an environment with time-varying volatility about which agents are imperfectly informed. In states of the world where volatility exceeds agents' perceptions, forecasters appear to underreact, while states in which volatility is lower than agents perceive cause apparent overreaction. I provide empirical evidence consistent with this mechanism, emphasizing the importance of accounting for the impact of volatility shifts for belief dynamics.

A New Fact to Discipline Models of Beliefs

Changes made to existing forecasts that are systematically correlated with subsequent forecast errors yield “error predictability,” a salient feature of survey data. Full information rational expectations (FIRE) models, by contrast, produce unpredictable errors, a fact motivating many non-FIRE theories. Within this non-FIRE group, I demonstrate that empirical error predictability is not typically enough to distinguish across alternative belief systems. Instead, I highlight an additional empirical fact that, paired with error predictability, can serve to further disentangle competing models of beliefs. In particular, I emphasize that any model featuring Bayesian updating requires that forecast revisions be serially uncorrelated. Applying this logic to two widely studied theories and taking it to data from the Survey of Professional Forecasters favors a model of diagnostic expectations over a model of beliefs driven by strategic interaction.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Essays on Empirical Microeconomics*

Main advisor: Raymond Fisman

M.A., Economics, Seoul National University, Seoul, South Korea, 2015

B.A., Economics (*Summa Cum Laude*), Seoul National University, Seoul, South Korea, 2012

FIELDS OF INTEREST

Political Economy, Behavioral Economics, Labor Economics

WORKING PAPERS

“Investor Attention to Firm versus Market-wide Information Shocks: Evidence from North Korean Missile Tests,” September 2020. Job Market Paper.

“The Effect of Daddy Quota on Gender Differences in Labor Market Outcomes,” (with Petra Niedermayerova), December 2019.

WORK IN PROGRESS

“Dynamic Effects of Immigration on Electoral Outcomes” (with Gerard Domènech)

“Does “Backfilling” Affect Incumbent Student Outcome in Charter Schools?” (with Marcus A. Winters)

“School Ties in the Judiciary”

FELLOWSHIPS AND AWARDS

Research Fellowship, Boston University, 2017-2020

Teaching Fellowship, Boston University, 2016

Dean’s Fellowship, Boston University, 2015

Brain Korea 21 Research Scholarship, Seoul National University, 2013-2015

Hyang Sang Fellowship, SNU College of Commerce Alumni Association, 2008-2010

WORK EXPERIENCE

Research Assistant for Marcus A. Winters, Boston University, 2019-2020

Research Assistant for Kevin Lang, Boston University, 2018

Research Assistant for Raymond Fisman, Boston University, 2017

REFeree EXPERIENCE

Journal of Law, Economics, and Organization

TEACHING EXPERIENCE

Instructor, Market and Economic Research and Analysis, Metropolitan College, Boston University, Fall 2019 & Spring 2020

Teaching Assistant, Mathematics for Economics, Department of Economics, Boston
University, Fall 2016 & Spring 2017

LANGUAGES

English (fluent), Korean (fluent), German (intermediate)

COMPUTER SKILLS: Python, Stata, R, LaTeX

CITIZENSHIP/VISA STATUS: South Korea/F1

REFERENCES

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CHEONGHUM PARK

Investor Attention to Firm versus Market-wide Information Shocks: Evidence from North Korean Missile Tests (Job Market Paper)

This paper studies whether investor attention towards newly-generated market-wide information leads to underutilization of firm-specific information. I exploit the unpredictability of the test outcomes of a series of missile tests by North Korea and analyze whether the market-wide information shocks distract investors in South Korea away from analyzing firm-specific earnings surprises announced on the same day. The analysis proceeds in two steps: I first compare the share price return after failed and successful missile tests and then investigate whether that impact draws investor attention and generates under-response to earnings surprises. The first part of the analysis shows that successful missile tests reduce the average share price return by 2.3% within two trading days compared to failed tests. Then I find that companies with earnings surprises in the top quantile experience a 1.6% increase in the abnormal return on the announcement day, but a same-day missile test takes away 70% of the positive response. The results show that salient information can crowd out another source of valuable information. I also find that investors process information more efficiently as tests repeat and conclude by examining the underlying mechanism of national security concerns.

Dynamic Effects of Immigration on Electoral Outcomes (*with Gerard Domènech*)

We study the effect of immigration on electoral outcomes using individual-level administrative data in Spain. We compare two channels through which immigration can affect the political preferences of the natives: assimilation, proxied by the endogenous decision to become a citizen, and cultural differences, proxied by the country of origin. The differential paths to Spanish citizenship by country of origin and the variation in past settlement patterns allow us to disentangle the channels in a multiple instrumentation framework. We find that naturalized immigrants increase the support for the parties most favorable to immigration and non-naturalized immigrants increase the support for the main right-wing party that is not favorable to immigration. We also find that the effect of naturalization is higher among Latin American immigrants. The results suggest that both channels account for the change in political preferences while the assimilation channel shows a higher effect.

The Effect of Daddy Quota on Gender Differences in Labor Market Outcomes (*with Petra Niedermayerova*)

This paper studies the impact of a father-specific parental leave policy on labor market outcomes. In 2006, Quebec reformed their parental leave policy to include up to three weeks of paid paternity leave that is not transferable to the mother. Using a state-level difference-in-difference approach, we find that the so-called daddy quota increased the probability of employment for women and decreased the wage of younger men. In a theoretical framework, we show that policy-driven changes in gender norms are consistent with our findings. The results suggest that daddy quota promoted equal opportunities for women in the labor market.

FERNANDO PAYRO

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Essays on Commitment and Flexibility*
Dissertation Committee: Larry Epstein, Jawwad Noor and Bart Lipman

M.A., Political Economy, Boston University, MA, 2018

B.S., Applied Mathematics (*Highest Honors*), ITAM, Mexico CDMX, 2015

B.A., Economics (*Honors*), ITAM, Mexico CDMX, 2015

FIELDS OF INTEREST

Microeconomic Theory, Decision Theory, Behavioral Economics

PUBLICATIONS

“Revealed Preference and the Subjective State Space Hypothesis,” *Journal of Mathematical Economics*, (2019) 82: 61-68.
“Similarity-based mistakes in choice,” (with Levent Ülkü) *Journal of Mathematical Economics*, (2015) 61: 152-156.

OTHER PUBLICATIONS

“Implications of the Patient Protection and Affordable Care Act on Insurance Coverage and Rehabilitation Use Among Young Adult Trauma Patients,” (with Cheryl Zogg, John Scott, Lindsey Wolf, Thomas Tsai, Peter Najjar, Olubode Olufajo, Eric Schneider, Elliott Haut, Adil Haider, Joseph Canner) *JAMA surgery*, (2016) 151: e163609-e163609.

WORKING PAPERS

“Mixture-Dependent Preference for Commitment,” October 2020. **Job Market paper.**

WORK IN PROGRESS

“Updating Under Imprecise Information”
“A Theory of Subjective Ambiguous Information” (joint with Yi-Hsuan Lin)

PRESENTATIONS

6th World Congress of the Game Theory Society, Budapest 2021 (scheduled)
Decision Theory Student Conference, organized by T. Strzalecki, July 2020
3rd ITAM Alumni Conference, ITAM Mexico CDMX, 2019
14th SAET Conference on Current Trends in Economics WASEDA UNIVERSITY Tokyo, Japan, 2014 (by co-author)

The 12th Meeting of the Society for Social Choice and Welfare, Boston College Chestnut Hill, MA, 2014 (by co-author)

FELLOWSHIPS AND AWARDS

Dean's Fellowship, Boston University, 2015-2020
Special Research Fellowship, Boston University, Spring 2019
Best Second Year Paper Award, Boston University, 2018
Summer Research Fellowship, Boston University, 2016

WORK EXPERIENCE

ACADEMIC

Research Assistant for Professor Larry Epstein, Department of Economics, Boston University, Spring 2018, Summer 2017,18,19
Research Assistant for Professor Levent Ülkü, CIE, ITAM, August 2014-May2015

NON-ACADEMIC

Economist, ProMexico, February 2015-July 2015

REFeree EXPERIENCE

Econometrica, Theoretical Economics, Mathematical Social Science

TEACHING EXPERIENCE

Instructor, Introduction to Mathematics for Economists-PhD Math Camp, Boston University, Summer 2017,18,19,20
Teaching Fellow, Introduction to Mathematical Economics (PhD), Department of Economics, Boston University, Fall 2017, 18, 19
Teaching Fellow, Principles of Microeconomics, Department of Economics, Boston University, Fall 2016, Spring 2020
Teaching Assistant, Principles of Microeconomics, Department of Economics, ITAM, Fall 2010-Spring 2013
Teaching Assistant, Intermediate Microeconomic Analysis, Department of Economics, ITAM, Fall 2013-Spring 2014

LANGUAGES

Fluent in English and Spanish

COMPUTER SKILLS: MATLAB, R, STATA, LaTeX

CITIZENSHIP/VISA STATUS: Mexico/F1

REFERENCES

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FERNANDO PAYRO

Mixture-Dependent Preference for Commitment (Job Market Paper)

The literature on temptation and self-control is motivated by evidence of a preference for commitment. Because of its reliance on the Independence axiom, this literature cannot accommodate *mixture-dependent* preference for commitment. In order to capture such behavior, this paper generalizes Gul and Pesendorfer (2001) by replacing their Independence axiom with a suitably adapted version of the Mixture-Betweenness axiom of Chew (1989)-Dekel (1986). The resulting model is an implicit utility model in which utility is defined implicitly as the unique solution to an equation that depends on the agent's commitment and temptation rankings. A distinct feature of the model is that the commitment and temptation rankings need not be linear. Axiomatizing the model involves a novel extension of the Mixture Space Theorem to preferences that satisfy Mixture-Betweenness. Since the Mixture Space Theorem is central to decision theory, this extension is potentially useful for addressing issues in economics other than temptation and self-control. Hence, we view it as a separate contribution of the paper.

Revealed Preference and the Subjective State Space Hypothesis

Journal of Mathematical Economics (2019)

Dekel et al. (2001) extends Kreps's (1979) model for preference over menus of deterministic alternatives to a model for preference over menus of lotteries. They show that a simple set of axioms characterizes a representation that can be interpreted as if the agent is uncertain about her future tastes. This taste uncertainty is summarized by a set of possible future preferences which is referred to as the subjective state space. Their approach is axiomatic; thus, testability requires that the entire preference order be observable. This paper provides corresponding revealed preference analysis assuming that only finitely many choices are observed. For a particular class of data sets, it is shown that the characterizing conditions can be reformulated as nonlinear systems of inequalities for which the existence of solutions can be verified using numerical methods

Similarity-based mistakes in choice (with Levent, Ülkü)

Journal of Mathematical Economics (2015)

We characterize the following choice procedure. The decision maker is endowed with two binary relations over alternatives, a preference and a similarity. In every choice problem, she includes in her choice set all alternatives which are similar to the best feasible alternative. Hence, she can, by mistake, choose an inferior option because it is similar to the best. We characterize this boundedly rational behavior by suitably weakening the rationalizability axiom of Arrow (1959). We also characterize a variation where the decision maker chooses alternatives on the basis of their similarities to attractive yet infeasible options. We show that similarity-based mistakes of either kind lead to cyclical behavior.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Essays on state-space and regime-switching models in a high-dimensional setting*

Main advisor: Zhongjun Qu

Dissertation Committee: Zhongjun Qu, Pierre Perron and Hiroaki Kaido

M.S., Quantitative Economics, Renmin University of China, Beijing, China, 2014

B.A., Economics, Renmin University of China, Beijing, China, 2011

FIELDS OF INTEREST

Econometrics, Time Series Econometrics, Financial Econometrics

WORKING PAPERS

“Modeling Regime Switching in High Dimensional Data with Applications to U.S. Business Cycles” (joint with Zhongjun Qu), Job Market Paper

WORK IN PROGRESS

“Inference on State Variables and Predictions in Linear Gaussian State Space Models with Aggregate and Disaggregate Data”

“Statistical Analysis of High Dimensional Autoregressive Markov Regime Switching Models”

“Asymptotic Properties of MLE for Continuous Time Markov Switching Models”(joint with Guang Zhang and Li Chen)

“Asset Prices Dynamics with Exogenous and Endogenous Jumps”

FELLOWSHIPS AND AWARDS

Dean’s Fellowship, Boston University, 2014-2019

Outstanding Graduate Students Awards , Renmin University, 2013

National Encouragement Scholarship, Renmin University, 2009-2010

TEACHING EXPERIENCE

Teaching Assistant, Advanced Econometrics I (PhD), Department of Economics, Boston University, Spring 2018 - 2019

Teaching Assistant, Advanced Econometrics II (PhD), Department of Economics, Boston University, Fall 2017 - 2018

Teaching Assistant, Empirical Economics Analysis I (Undergraduate), Department of
Economics, Boston University, Spring 2016 - 2017
Teaching Assistant, Empirical Economics II and Financial Economics (Undergraduate),
Department of Economics, Boston University, Fall 2016
Teaching Assistant, Intermediate Microeconomics (Undergraduate), Department of
Economics, Boston University, Fall 2015
Teaching Assistant, Advanced Microeconomics (Master), Renmin University, Fall 2013

LANGUAGES

English (fluent), Chinese (native)

COMPUTER SKILLS: MATLAB, LaTeX, Python

CITIZENSHIP/VISA STATUS: China/F1

REFERENCES

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Professor Hiroaki Kaido
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Modeling Regime Switching in High Dimensional Data with Applications to U.S. Business Cycles (*with Zhongjun Qu*), *Job Market Paper*

Identifying business cycles and forecasting macroeconomic variables are two essential tasks of empirical macroeconomic research. In this paper, we develop a modeling framework and propose estimation methods for uncovering regime switching in high dimensional data (i.e., with large N and T). A leading application is to dating U.S. business cycles using disaggregated data. We demonstrate that under certain conditions, the proposed model dominates its corresponding aggregate model in its inference on state variables and forecasts of aggregate observable variables. The intuition is that there are two sources of randomness for disaggregate processes: the error terms and the state variables. By aggregation, the information on the state variables can average out while the noise on the error terms can accumulate. Due to the high dimensionality of the parameter space, the standard MLE fails to converge, and we develop an effective Gibbs sampling algorithm for estimation and inference. As an empirical application, we consider a dataset consisting of four groups of U.S. aggregate macroeconomic variables and their disaggregate sub-series: industrial production, capacity utilization, employment rate, and hours worked. There are two significant findings. First, in most cases, the proposed model produces smaller mean squared forecasting errors than the corresponding aggregate model. The model also provides forecasts for sub-series (e.g., state-level unemployment), which the aggregate model can not offer. Second, the inference on probabilities of recessions from our model is very close to the NBER's business cycle dating results.

Inference on State Variables and Predictions in Linear Gaussian State Space Models with Aggregate and Disaggregate Data

In mean squared errors sense and for small scale aggregation, this paper shows in theory that for linear Gaussian state space models, the disaggregate model dominates its corresponding aggregate model in terms of both the inference on common state variables and the forecast on aggregate observable variables. The contribution of this paper is twofold. First, it extended the well known results from ARMA models to linear Gaussian state space models that disaggregate model have better forecast than aggregate model. Second, we derived new theoretical results for inference on common state variables in the context of aggregate and disaggregate models which again indicates that disaggregate model has better inference on state variables than aggregate model. The Monte Carlo simulation confirms our theoretical results. The application of analyzing the data of total unemployment and its disaggregate unemployment by genders also shows some evidence favoring the disaggregate model. However, for general nonlinear non-Gaussian state space models, there are no existing theoretical findings yet.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

M.A., International Economics, Graduate Institute of International and Development Study, Geneva, Switzerland, 2016

B.A., Economics, Shanghai Jiaotong University, Shanghai, China, 2014

FIELDS OF INTEREST

Macroeconomics, Finance

PUBLICATIONS

“Monetary Policy and Rational Asset Bubbles: Comments,” (with Jianjun Miao and Pengfei Wang) *American Economic Review*, (2019) 109(5): 1969-1990.

“Student Solution Manual to Accompany Economic Dynamics in Discrete Time,” (with Yue Jiang, Jianjun Miao, Dongling Su, Zhiteng Zeng, and Fan Zhuo) MIT Press, March 2020.

WORKING PAPERS

“Production of Private Safe Assets and Macroprudential Policy,” (Job Market Paper) September 2020.

“Leverage of Financial Intermediaries in the Crisis,” November 2019.

WORK IN PROGRESS

“Bubbles and Interbank Borrowing” (joint with Dongling Su)

FELLOWSHIPS AND AWARDS

Teaching Fellowship, Boston University, 2017-2020
Summer Research Grant, Boston University, 2017
Dean’s Fellowship, Boston University, 2017
Tuition Scholarship, The Graduate Institute of Geneva, 2015, 2016
Outstanding Graduates, Shanghai Jiaotong University, 2014

TEACHING EXPERIENCE

Teaching Assistant, Department of Economics, Boston University
EC707 Advanced Statistics for Economists, Fall 2017-2020
EC544 Introduction to Economic Dynamics, Spring 2019
EC502 Macroeconomic Theory, Spring 2018

PERSONAL INFORMATION

Languages: Fluent in English, Native in Chinese, Elementary in French
Computer Skills: Matlab, Stata, C++, Python, R
Citizenship/Visa Status: Chinese/F1

REFERENCES**Professor Jianjun Miao**

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Boston University
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Professor Stephen Terry

Department of Economics
Boston University
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Email: stephent@bu.edu

Professor Adam Guren

Department of Economics
Boston University
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Email: guren@bu.edu

ZHOUXIANG SHEN

Production of Private Safe Assets and Macroprudential Policy (Job Market Paper)

I study the macroprudential policy tradeoff between the benefit and the risk associated with the production of private safe assets when the economy has a shortage of safe assets. The bank issues private safe assets against risky projects whose return is subject to aggregate risk. The private safe assets are demanded by both the household for their liquidity service and the entrepreneurs as a store of value to insure against idiosyncratic investment shocks. A shortage of safe assets lowers the interest rate, hinders the function of private safe assets as a store of value, and leads to a reduction in the entrepreneurs' wealth and output. In response to the shortage of safe assets, the bank expands its balance sheet to produce more private safe assets but exposes itself to more aggregate risk. A negative aggregate shock deteriorates the bank's balance sheet, reduces the production of private safe assets, and leads to a reduction in the output. Macroprudential policies can adjust the production of private safe assets with a tradeoff: encouraging the production of private safe assets alleviates the shortage of safe assets, at the cost of more risk exposure of the bank.

Monetary Policy and Rational Asset Bubbles: Comments

(with Jianjun Miao and Pengfei Wang)

We revisit Gali's (2014) analysis by extending his model to incorporate persistent bubble shocks. We find that, under adaptive learning, a stable bubbly steady state and the associated sunspot solutions under optimal monetary policy are not E-stable. When deriving the unique forward-looking minimum stable variable (MSV) solution around an unstable bubbly steady state, we obtain results that are consistent with the conventional views: leaning-against-the-wind policy reduces bubble volatility and is optimal. Such a steady state and the associated MSV solution are E-stable.

Leverage of Financial Intermediaries in the Crisis

I find shadow banks deleveraged while commercial banks increased their leverage during the 2007- 2008 financial crisis. This contrasting leverage pattern can be explained by the different funding sources of shadow banks and commercial banks. Banks who rely more on short-term funding tend to deleverage more during the crisis. I then build a model to incorporate both shadow banks and commercial banks. The leverage of shadow banks is determined by a Value-at-risk rule while the leverage of commercial banks is determined by the agency friction between bankers and depositors. The model can explain leverage dynamics and the flight-to-quality phenomenon observed in data.

CHENLU SONG

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Essays on Health Care Demand and Risk Adjustment*
Main advisor: Randall P. Ellis

M.A., Political Economy, Boston University, Boston MA, May 2016

B.Sc., Economics and Finance, The Hong Kong University of Science and Technology (HKUST), Hong Kong SAR, China, June 2013

FIELDS OF INTEREST

Health Economics, Applied Microeconomics

PUBLICATIONS AND SUBMITTED PAPERS

“Diagnostic Category Prevalence and the Transition to ICD-10-CM,” (with Randall P Ellis, Bruno Martins, Heather Hsu, Jeffrey J Siracuse, Tzu-Chun Kuo, Arlene S Ash), *JAMA Network Open*, accepted in February 2020.

WORKING PAPERS

“[What Saves More: Coinsurance or Copayment?](#),” (Job Market Paper with Xiaoxi Zhao), November 2019.

“Diagnostic Items: A New Framework for Disease Surveillance, Prediction and Risk Adjustment” (with Randall P Ellis, Corrinne Andriola, Arlene S Ash, Victoria Fan, Summer Hawkins, Heather E Hsu, Brian C Jacobson, Tzu-Chun Kuo, Karen E Lasser, Bindu Kalesan, Jeffrey J Siracuse, Ying Liu, Allan Walkey), October 2019.

WORK IN PROGRESS

“High Speed Rail and Demographic Patterns: Evidence from China”.

PRESENTATIONS

8th Conference of the American Society of Health Economics, Poster Session, Washington, DC, 2019

Risk Adjustment Network Annual Conference, Portland, ME, 2019 (presentation by coauthor)

FELLOWSHIPS AND AWARDS

Diversity Scholarship, ASHEcon, 2019
Teaching Fellow, Boston University, 2014 - 2019
Dean's Fellowship, Boston University, 2013
Scholarship for Continuing Students, HKUST, 2010 - 2013

WORK EXPERIENCE

Research Assistant for Randall P. Ellis, Boston University, 2018 – Present
Intern Analyst, Accenture, 2016
Research Assistant for Sujata Visaria, HKUST, 2012 - 2013

TEACHING EXPERIENCE

Teaching Fellow, Department of Economics, Boston University
EC101 Introductory Microeconomic Analysis, Fall 2017
EC102 Introductory Macroeconomic Analysis, Spring 2016, Spring 2017
Teaching Assistant, Department of Economics, Boston University
EC391 International Trade, Fall 2014, Fall 2015
EC392 International Macroeconomics, Fall 2015
EC591 International Economics, Fall 2015
EC201 Intermediate Microeconomic Analysis, Spring 2015
EC551 The Economics of Labor Markets, Spring 2015
EC521 Development Policy, Fall 2014

LANGUAGES

Native in Chinese Mandarin and Cantonese. Fluent in English.

COMPUTER SKILLS

STATA, SAS, MATLAB, LaTeX

CITIZENSHIP/VISA STATUS

Chinese/F1

REFERENCES

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**Professor Ching-To
Albert Ma**
Department of Economics
Boston University
Phone: (617) 353-4010
Email: ma@bu.edu

**Professor Robert A.
Margo**
Department of Economics
Boston University
Phone: (617) 353-6819
Email: margora@bu.edu

What Saves More: Coinsurance or Copayments? (Job Market Paper with Xiaoxi Zhao)

We use large-scale health insurance claims data to separately estimate demand elasticities of disaggregated service types under different cost sharing designs. Individual monthly price levels are instrumented by a full set of interactions of plan indicators and month indicators, capturing within year variation in prices at the plan level. We assume that consumers are myopic and backward-looking when deciding how much health care to consume, and interpret our elasticity estimates as the short-run spot price elasticities. We find that consumer demand is more elastic when charged a fixed percent coinsurance rate instead of a fixed dollar copayment, suggesting that coinsurance is more effective for cost containment purposes.

Diagnostic Category Prevalence and the Transition to ICD-10-CM (with Randall P Ellis, Heather E Hsu, Tzu-Chun Kuo, Bruno Martins, Jeffrey J Siracuse, Ying Liu, Arlene S Ash)

We use regression discontinuity analysis on monthly time series data to assess changes in diagnostic category prevalence associated with the International Statistical Classification of Diseases, Tenth Revision (ICD-10) transition. IBM MarketScan commercial insurance claims from 2010–2017 are mapped into three widely used diagnostic classification systems: the World Health Organization’s disease chapters (WHO); the Department of Health and Human Services Hierarchical Condition Categories (HHS-HCC); and the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification System (CCS). This study covers over 20 million privately-insured enrollees under age 65. In all three classification systems, ICD-10 implementation was associated with statistically significant changes in monthly prevalence of any magnitude among 58–59% of diagnostic categories. Clinical review suggested that these patterns were largely due to the omission or addition of diagnoses from the affected diagnostic categories following the ICD-10 transition. Previously developed predictive models and diagnostic classification systems for payment and quality reporting should be used with caution until refined for ICD-10 data.

Diagnostic Items: A New Framework for Disease Surveillance, Prediction and Risk Adjustment (with Randall P Ellis, Corrinne Andriola, Arlene S Ash, Victoria Fan, Summer Hawkins, Heather E Hsu, Brian C Jacobson, Tzu-Chun Kuo, Karen E Lasser, Bindu Kalesan, Jeffrey J Siracuse, Ying Liu, Allan Walkey)

We create a new organizational framework of multiple dimensions based on Diagnostic Items (DXIs) that can be used for disease surveillance, prediction of spending, and estimation of risk-adjusted payments, taking full advantage of the fivefold increase in diagnostic details of ICD-10-CM. IBM MarketScan commercial insurance claims from 2016–2017 are first organized using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification System (CCS), and then clinically refined to create approximately 1,700 DXIs. We use linear regression with step-by-step iterative selection of variables to identify new predictors for risk adjustment and utilization prediction, and demonstrate that there is an improvement of 10% above models using only coarser diagnostic categories. These refinements meaningfully reduce potential profit to health plans from selecting enrollees whose expected payments exceed actual costs.

LISA A. TARQUINIO

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EDUCATION

Ph.D. Student, Economics, Boston University, Boston MA, 2021 (expected)

Dissertation Committee: Dilip Mookherjee, Tarek Hassan, and Ray Fisman

M.A., Political Economy, Boston University, Boston, MA, 2018

B.A., Double Major Economics and International Relations and Minor in Arabic, *Summa Cum Laude*, Phi Beta Kappa, Boston University, Boston, MA, 2011

FIELDS OF INTEREST

Development Economics, Political Economy, and Environmental Economics

PUBLISHED PAPERS

Tropical and Extratropical Cyclone Damages Under Climate Change (with Matthew Ranson, Carolyn Kousky, Matthias Ruth, Lesley Jantarasami, and Allison Crimmins) *Climatic Change* (2014) 127(2): 227-241.

WORKING PAPERS

"The Politics of Drought Relief: Evidence from Southern India," October 2020, Job Market Paper.

"Immigration, Innovation, and Growth," (with Konrad Burchardi, Thomas Chaney, Tarek Hassan, and Stephen Terry), May 2020, NBER Working Paper 27075.

"Modeling the Impact of Climate Change on Extreme Weather Losses," (with Matthew Ranson and Audrey Lew), May 2016, NCEE Working Paper 2016-02.

WORK IN PROGRESS

"The Impact of Drought on Household Behavior: Evidence from Agricultural Investment in India"

"Understanding Segregation in England and Wales" (with Sergio Villar Vallenias)

CONFERENCES AND PRESENTATIONS

Economic History Association Annual Meeting, September, 2020

World Congress of the Econometric Society, August, 2020

Pre-Conference to NBER DEV Conference, July, 2020

ASSA Annual Meeting, San Diego, California, January 3, 2020

Indian School of Business Hyderabad, Hyderabad, India, August 16, 2019

Indian Statistical Institute Delhi, New Delhi, India, August 2, 2019

Delhi School of Economics, New Delhi, India, August 1, 2019

Wharton Conference on Migration, Organizations, and Management, Wharton Business School, Philadelphia, Pennsylvania, May 31, 2019

GRANTS AND AWARDS

Rosenstein-Rodan Prize for the Best Graduate Student Paper on Development Economics, 2020

"Drought Relief in India," Manual Abdala Grant, 2019

"Drought Relief in India," Boston University Institute for Economic Development Data Grant, 2019

Dean's Fellowship, Boston University, 2015

WORK EXPERIENCE

ACADEMIC

Research Assistant for Tarek Hassan, Boston University, 2017-Present

NON-ACADEMIC

Analyst; Associate Analyst; Research Assistant, Environment and Resources Division, Abt Associates, 2011-2015

Research Assistant (Internship), New England Public Policy Center, Federal Reserve Bank of Boston, Spring 2011

Research Assistant to Member of Parliament (Internship), House of Commons of the United Kingdom, Spring 2010

REFeree EXPERIENCE

Journal of Labor Economics, The RAND Journal of Economics

TEACHING EXPERIENCE

Teaching Assistant, Energy and Environmental Economics, Department of Economics, Boston University, Fall 2019 and Fall 2016

Teaching Assistant, Introduction to Health Economics, Department of Economics, Boston University, Spring 2017

Teaching Assistant, Environmental Economics, Department of Economics, Boston University, Spring 2017 and Fall 2016

Course Assistant, Linear Algebra and Real Analysis II (23b/E23b), Department of Mathematics, Harvard University, Spring 2015

Course Assistant, Linear Algebra and Real Analysis I (23a/E23a), Department of Mathematics, Harvard University, Fall 2014

DEPARTMENTAL SERVICE

Organizer, Development Reading Group, 2018-2019

Editor for the Institute of Economic Development's Research Review, 2017

LANGUAGES: English (native), Spanish (intermediate), and Arabic (beginner/intermediate)

COMPUTER SKILLS: R, Stata, \LaTeX , ArcGIS

CITIZENSHIP: USA

REFERENCES

Professor Dilip Mookherjee
Department of Economics
Boston University
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Professor Tarek Hassan
Department of Economics
Boston University
Email: thassan@bu.edu

Professor Ray Fisman
Department of Economics
Boston University
Email: rfisman@bu.edu

LISA A. TARQUINIO

The Politics of Drought Relief: Evidence from Southern India (Job Market Paper)

A critical role of government is to provide assistance to households affected by negative shocks, such as natural disasters. This paper studies such government intervention in the form of official drought declarations in three Indian states. First, I demonstrate that while states' targeting of drought relief partly aligns with environmental criteria, it does not strictly adhere to national guidelines. Instead, I find that allocations are disrupted by political motivations: the likelihood of receiving a declaration increases in an area's electoral competitiveness while areas aligned with the state ruling party are less likely to receive a declaration. I develop a dynamic probabilistic voting model, driven by the state ruling party's reelection motives, that explains these results. The model also highlights potential endogeneity concerns in empirical specifications connecting political conditions to drought declarations. To causally identify the relationship between electoral incentives and declarations, I thus construct instruments for electoral competition and incumbency utilizing the interaction of a party's vote share in a prior period with a state-level, leave-one out change in support. I confirm that the associations I report reflect a causal relationship. Finally, I offer suggestive evidence that the mistargeting of declarations, relative to national guidelines, results in a misallocation of public resources.

Immigration, Innovation, and Growth (with Konrad B. Burchardi, Thomas Chaney, Tarek A. Hassan, and Stephen J. Terry)

We show a causal impact of immigration on innovation and dynamism in US counties. To identify the causal impact of immigration, we use 130 years of detailed data on migrations from foreign countries to US counties to isolate quasi-random variation in the ancestry composition of US counties that results purely from the interaction of two historical forces: (i) changes over time in the relative attractiveness of different destinations within the US to the average migrant arriving at the time and (ii) the staggered timing of the arrival of migrants from different origin countries. We then use this plausibly exogenous variation in ancestry composition to predict the total number of migrants flowing into each US county in recent decades. We show four main results. First, immigration has a positive impact on innovation, measured by the patenting of local firms. Second, immigration has a positive impact on measures of local economic dynamism. Third, the positive impact of immigration on innovation percolates over space, but spatial spillovers quickly die out with distance. Fourth, the impact of immigration on innovation is stronger for more educated migrants.

SILVIA VANNUTELLI

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Three Essays in Applied Microeconomics*

Dissertation Committee: Ray Fisman, Daniele Paserman, Johannes Schmieder

Visiting PhD Student, University of Chicago, Booth School of Business, 2019-2020

M.Sc., European Economy and Business Law, (*Summa Cum Laude*), Univ. of Rome Tor Vergata, 2015

B.S., Political Science (*Summa Cum Laude*), University of Roma Tre, 2013

Visiting Student (Erasmus Program), Université Paris 1 Panthéon Sorbonne, 2012-2013

FIELDS OF INTEREST

Public Economics, Political Economy, Labor Economics

PUBLICATIONS

“Social Preferences in Larger Groups: Keeping up with the Joneses and Keeping Track of the Tails,” (w. Raymond Fisman and Ilyana Kuziemko), *Journal of the European Economic Association*, (2020)

WORKING PAPERS

“From Lapdogs to Watchdogs: Random Auditor Assignment and Municipal Fiscal Performance in Italy,” (Job Market Paper) October 2020.

“80 Euro for a Vote? The Electoral Effects of Stimulus Transfers in Italy,” 2020.

“Bringing Them in or Pushing Them Out? The Labor Market Effects of Pro-cyclical Unemployment Assistance Reductions,” (w. Gerard Domènech-Arúmi), 2020, *Submitted*.

“Rules, Discretion and Corruption in Procurement: Evidence from Italian Government Contracting,” (w. Francesco Decarolis, Raymond Fisman and Paolo Pinotti), 2019, *Submitted*.

“Gender and Bureaucratic Corruption: Evidence from Two Countries,” (w. Francesco Decarolis, Raymond Fisman, Paolo Pinotti and Yongxiang Wang), 2020, *Submitted*.

“The Distributional Preferences of Americans, 2013-2016,” (w. Raymond Fisman, Pamela Jakiela and Shachar Kariv), 2020, *Submitted*.

WORK IN PROGRESS

“The impact of immigration on local labor markets: Evidence from the 2007 EU enlargement” (w. Vittoria Dicandia)

PRESENTATIONS

TOBIN Project, Inequality and Decision Making Graduate Student Workshop (Discussant, October 2020)

Harvard University, Department of Government (November 2020, scheduled)

Northwestern University – Kellogg School of Business, Development Lunch Seminar (May 2020)

University of Chicago, Harris School of Policy – Political Economy in the Chicago Area (March 2020)

Harvard University, Department of Government - Graduate Lunch Seminar (December 2019)

University of Chicago, Harris School of Policy - Political Economy Lunch Seminar (November 2019)

EALE 2019, European Association of Labor Economists (Uppsala, September 2019)

ECINEQ 2019, Society for Economic Inequality (Paris, July 2019);

SIOE 2019, Society for Institutional & Organizational Economics (Stockholm, June 2019)

IEB (Institut Economia Barcelona) 8th Workshop on Political Economy (June 2019)

TOBIN Project, Inequality and Decision Making Conference (April 2019)

Bank of Italy, Public Finance Division Workshop (Rome, December 2018)
World Bank - Bank of Italy Conference - Building Human Capital for the 21st Century (Rome, 2018);

FELLOWSHIPS AND AWARDS

Manuel Abdala Gift Research Grant, Boston University, 2020
Graduate Research Abroad Fellowship, Boston University, 2020
Graduate Research Abroad Fellowship, Boston University, 2019
Visitinps Fellowship, Italian Social Security Agency, 2019
Research Fellowship, Italian Institute for Public Policy Evaluation (INAPP), 2018-2019
Summer Research Award, Boston University, 2018
Bank of Italy Summer Fellowship, 2017
Dean's Student Fellowship, Boston University, 2015
Institute for New Economic Thinking (INET) Summer School Fellowship, 2015
European Union Erasmus Fellowship - Paris 1 University Pantheon-Sorbonne, 2012-2013

DEPARTMENTAL SERVICE

Women In Economics (WeOrg), Boston University, Co-Chair, 2017-2019
"Women In Economics: Research, Ideas, Solutions, Executions" (WeRise) Conference, Boston University, Organizer, Summer 2019
Graduate Economics Association, Boston University, Officer, 2017-2018

REFeree EXPERIENCE

American Economic Journal: Economic Policy, Review of Economics and Statistics, Journal of Economic Inequality, Social Science Research

WORK EXPERIENCE

Research Assistant for Raymond Fisman, Boston University, Fall 2016 to Spring 2017, Fall 2020
Research Assistant for Francesco Decarolis, Bocconi University, Spring 2018 to Spring 2020
Research Assistant for Francesco Decarolis, Boston University Fall 2017

TEACHING EXPERIENCE

Teaching Assistant, Modern Difference-in-Differences Designs, ICPSR, University of Michigan, Summer 2020
Teaching Fellow, EC 367 Economics of the Public Sector, Boston University, Fall 2016
Teaching Fellow, EC 379 Markets and Development Economics, Boston University, Fall 2016

LANGUAGES: Italian (native), English (fluent), French (intermediate), Spanish (beginner).

COMPUTER SKILLS: STATA, R, Python, LaTeX

CITIZENSHIP/VISA STATUS: Italian/F1

REFERENCES

Professor Raymond Fisman

Department of Economics
Boston University
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Professor Daniele Paserman

Department of Economics
Boston University
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Professor Ilyana Kuziemko

Department of Economics
Princeton University
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Professor Johannes Schmieder

Department of Economics
Boston University
johannes@bu.edu

From Lapdogs to Watchdogs: Random Auditor Assignment and Municipal Fiscal Performance in Italy (Job Market Paper)

Monitoring is a common tool to mitigate agency problems. Monitors themselves, however, may be biased or corrupted, in particular if they feel obliged to please the party that appoints them. In this paper, I evaluate whether shifting control over auditor assignments improves monitoring effectiveness and impacts outcomes of the audited party. In 2011, Italy switched from allowing mayors to appoint municipal auditors to a system of random assignment, to strengthen oversight and ensure the financial soundness of municipal budgets. My identification exploits the reform's staggered introduction across municipalities in a generalized difference-in-differences setting. I obtain three main findings. First, treated municipalities increase their net surpluses by 9% and debt repayments by 8%, in accordance with national government objectives. Second, the improvement is achieved through revenue-based consolidation, rather than by cutting expenditures. Third, treatment effects are significantly larger for municipalities that were more at risk of collusion before the reform, and for those that are matched to a more distant or less connected auditor. Taken together, these findings provide novel quantitative evidence of the importance of independence in auditing, and highlight the improvement in outcomes that may result from changes in the design of monitoring institutions.

80 Euro for a Vote? The Electoral Effects of Stimulus Transfers in Italy

This paper investigates the effect of a large stimulus payment on the electoral performance of the incumbent government. I leverage the quasi-exogenous variation at the municipal level in the share of beneficiaries of a large tax credit introduced in Italy in 2014, immediately before an election. I apply a difference-in-differences design to study the effect of the policy on electoral performance of the incumbent party in subsequent elections. The program yields significant electoral returns: a 1 percentage point increase in the share of recipients leads to a 0.19 percentage points increase in the incumbent party's vote share in subsequent elections. The effect persists up to 5 years after the policy introduction. Overall, results provide evidence of sustained reciprocity and retrospective voting.

Bringing Them in or Pushing Them out? The Labor Market Effects of Pro-cyclical Unemployment Assistance Reductions (with Gerard Domenech-Arumi) *Submitted*.

We causally estimate the effects of pro-cyclical unemployment-assistance (UA) reductions on job search behavior and re-employment outcomes using reform-induced changes in UA durations for older workers in Spain. Benefit reductions are effective in bringing workers back to work and reduce non-employment duration, but also induce displacements out of the labor force and strong substitution patterns towards less generous UA programs, highlighting the social insurance role of long-term benefits during economic downturns. Despite the sharp drop in non-employment duration, we also document a large decrease in re-employment wages, consistent with a reduction in workers' reservation wages and limited duration dependence.

Rules, Discretion and Corruption in Procurement: Evidence from Italian Government Contracting (with Francesco Decarolis, Raymond Fisman and Paolo Pinotti, 2019) *Submitted*.

We study discretion and corruption in Italian government procurement auctions, using a confidential database of firms and procurement officials investigated for corruption by enforcement authorities. We show that discretionary auctions are associated with corruption only when conducted with “too few” bidders or employing discretionary criteria. Further while “corruptible” discretionary auctions are chosen more often by officials investigated for corruption, they are used less by procurement administrations investigated for corruption. These findings fit with a framework in which discretion leads to efficiency and also theft opportunities, and a central monitor manages this trade-off by limiting discretion for high-corruption procedures and locales.

SERGIO VILLAR VALLENAS

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Three Essays in Empirical Economics*

Dissertation Committee: Adam Guren, Yuhei Miyauchi, Laurence Kotlikoff

M.A., Political Economy, Boston University, Boston MA, 2019

B.A., Economics & Mathematics (*Magna Cum Laude*), Columbia College, Columbia U.

New York NY, 2013

FIELDS OF INTEREST

Urban Economics, Applied Microeconomics

PUBLICATIONS

“The True Cost of Social Security,” (joint with Blocker, Alexander W., Kotlikoff, Laurence J., & Ross, Stephen A.) *Tax Policy and the Economy*, (2019) 33: 131-63.

WORKING PAPERS

“The Impact of Transport Costs on the Structure of Cities: Evidence from the London Tube,” September 2020. Job Market paper.

“Distributional Effects of Banking Deregulation through the Mortgage Market,” October 2017.

WORK IN PROGRESS

“Understanding Segregation in England and Wales” (joint with Lisa Tarquinio)

PRESENTATIONS

NBER Tax Policy and the Economy, Washington, D.C., 2018

FELLOWSHIPS AND AWARDS

Dean’s Fellowship, Boston University, Fall 2015-Spring 2016

WORK EXPERIENCE

Research Assistant for Laurence J. Kotlikoff, Boston University, Boston, 2017-8

Research Assistant for Adam Guren, Boston University, Boston, 2016

Research Associate, Columbia Business School, New York, 2013-5

Summer Research Intern for Casey Ichniowski, Columbia Business School, New York, 2012

Research Assistant for Raymond Fisman, Columbia Business School, New York, 2011

TEACHING EXPERIENCE

Head Teaching Fellow, Introductory Macroeconomic Analysis, Boston University, Spring 2019-20

Teaching Fellow, Introductory Macroeconomic Analysis, Boston University, Fall 2018

Teaching Assistant, Intermediate Macroeconomic Analysis, Boston University, Spring 2017, Fall 2019

DEPARTMENTAL SERVICE

Organizer, Macroeconomics Student Workshop, 2018-20

Co-captain, Intramural soccer team, 2018-20

LANGUAGES

Fluent in English, Spanish, and French

COMPUTER SKILLS: R, ArcGIS, Stata, MATLAB, LaTeX, Unix, Julia, Python, SQL

CITIZENSHIP/VISA STATUS: Peru, Switzerland/U.S. Green Card (Citizenship expected Jan. 2021)

REFERENCES

Professor Adam Guren

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Professor Yuhei Miyauchi

Department of Economics

Boston University

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Professor Laurence Kotlikoff

Department of Economics

Boston University

Phone: (617) 353-4002

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SERGIO VILLAR VALLENAS

The Impact of Transport Costs on the Structure of Cities: Evidence from the London Tube (Job Market Paper)

I study the effect of changes in public transit fares on the demographics of a modern city. A 1983 policy by the London government mandated that underground train fares be simplified and resulted in a fare structure that was discontinuous over space, creating fare zones within which transit costs were uniform. I find that subway ridership responded significantly by decreasing in neighborhoods where fares were raised most, with commuters spilling over mostly to riding buses. I also find that the occupation mix became more working-class in areas where fares were raised most. These results suggest that amenities may have formed endogenously in certain neighborhoods as a consequence of them being assigned to more central zones, but further research is needed to incorporate a framework for amenities.

The True Cost of Social Security

(with Alexander W. Blocker, Laurence J. Kotlikoff, & Stephen A. Ross)

Implicit government obligations represent the lion's share of government liabilities in the U.S. and many other countries. Yet these liabilities are rarely measured let alone properly adjusted for their risk. This paper shows, by example, how modern asset pricing can be used to value implicit fiscal debts taking into account their risk properties. The example is the U.S. Social Security System's net liability to working-age Americans. Marking this debt to market makes a big difference. Its market value is 86 percent higher than the Social Security trustees' valuation method suggests. Our alternative arbitrage pricing theory specifications range from 74% to 115% higher than that of the Social Security Administration.

SHUANG WANG

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Email: shuangw@bu.edu
Web site: <http://s-wang.com>

EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Essays on Discrete Choice Model Estimation*
Dissertation Committee: Marc Rysman, Hiroaki Kaido and Jihye Jeon

M.A., Economics, Duke University, Durham NC, 2015

B.S., Economics and B.A., English Literature (with Honors), Zhejiang University, Hangzhou, Zhejiang, China, 2013

FIELDS OF INTEREST

Industrial Organization, Applied Microeconometrics

PUBLICATION

Bin Xu, Shuang Wang, and Zhijian Wang (2014) “Periodic Frequencies of the Cycles in 2×2 Games: Evidence from Experimental Economics,” *European Physics Journal B*, 87.2, 46.

WORKING PAPERS

“Price Competition with Endogenous Entry: The Effects of Marriott & Starwood’s Merger in Texas,” (Job Market Paper), September 2020.

“Payment Instrument Choice with Scanner Data: An MM algorithm for Fixed Effects in Non-linear Models,” (with Mingli Chen, Marc Rysman and Krystof Wozniak), September 2020.

“Spatial Competition and Missing Data: An Application to Cloud Computing,” (with Jacob LaRiviere and Aadharsh Kannan), August 2020.

WORK IN PROGRESS

“The Impact of the Zero Emissions Vehicle Mandates on the California Automobile Market” (joint with David Rapson and Marc Rysman).

PRESENTATIONS

The 7th Lindau Nobel Laureate Meeting on Economic Sciences, July 2020
NBER Economics of Digitization (presented by co-author), Stanford CA, March 2019
North American Economic Science Association Conference, Tucson AZ, November 2012
Asia-Pacific Economic Science Association Conference, Xiamen, Fujian, China, November 2011

PROFESSIONAL EXPERIENCES

Research Intern, Office of Chief Economist, Microsoft Research, Redmond WA, Summer 2017, Summer 2020

Economist Intern, Device Economics Team, Amazon.com, Seattle WA, Summer 2019

RESEARCH ASSISTANT EXPERIENCE

Research Assistant for Prof. Marc Rysman, Department of Economics, Boston University, Fall 2018 – present

Research Assistant for Prof. Francesco Decoralis, Department of Economics, Boston University, Fall 2017 – Spring 2018

TEACHING EXPERIENCE

Teaching Fellow, Statistics for Economists (MA level), Department of Economics, Boston University, Fall 2016, Spring 2017

Teaching Assistant, Applied Econometrics in Microeconomics (MA level), Department of Economics, Duke University, Spring 2015

FELLOWSHIPS AND AWARDS

Deans' Fellowship, Boston University, 2015-2020

Summer Stipend, Boston University, 2016-2019

Merit-based Tuition Waiver (40%), Duke University, 2013-2015

First-Class Scholarship (Top 5%), Zhejiang University, 2010-2012

REFeree EXPERIENCE

The RAND Journal of Economics, Transactions on Economics and Computation

LANGUAGES

English (fluent), Chinese (native)

COMPUTER SKILLS: Proficient in R, SQL, MATLAB, STATA, LaTeX and Basics in Python

CITIZENSHIP/VISA STATUS: China/F1

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SHUANG WANG

Price Competition with Endogenous Entry: The Effects of Marriott & Starwood's Merger in Texas (Job Market Paper)

This paper quantifies the social welfare effects of Marriott's acquisition of Starwood in Texas. Using a price competition model with endogenous entry, I simulate pre- and post-merger equilibrium market outcomes. I use moment inequality estimation to avoid any arbitrary equilibrium selection mechanism, and propose a novel dominant strategy equilibrium lower bound to reduce the intimidating computation burden from having many players. Results imply a fairly competitive industry, where the price elasticity is between $[-15.12, -11.21]$. Comparing the pre- and post-merger scenarios, I show that the merger is beneficial for consumers. In markets that are currently being served, the merger increases consumer surplus by 17.14%-24.03%; while in potential markets, 6%-24% of them will have either Marriott or Starwood entered after the merger. Notably, I find that when the entry stage is overlooked, the biases in cost synergy effect and the neglect of entry into new markets would oppositely determine a harmful merger.

Payment Instrument Choice with Scanner Data: An MM algorithm for Fixed Effects in Non-linear Models

(with Mingli Chen, Marc Rysman and Krystof Wozniak)

Over the past several decades, the US payments system has shifted from paper payment instruments, namely cash and check, to digital instruments, such as debit cards and credit cards. This paper studies the determinants of this payment choice transition over short and long horizons. Using transaction level panel data, we estimate a multinomial logit discrete choice model with household-choice-quarter fixed effects. We develop a new method based on the Minorization-Maximization (MM) algorithm to address the prohibitive computational challenge of estimating over 1 million fixed effects in a nonlinear model. Results show that over a short horizon (within a quarter), the probability of using card increases with transaction sizes. While over long horizon (five-year period of the data), aggregate value-weighted card usage increases by 9.73 percentage points. With the estimated quarterly household-choice fixed effects, we decompose such an increase into different channels and find that only a third of it is due to the changes in household preferences.

Spatial Competition and Missing Data: an Application to Cloud Computing

(with Jacob LaRiviere and, Aadharsh Kannan)

The internet was hypothesized to be the “death of distance”. We investigate this hypothesis with a novel anonymized customer level dataset on demand for cloud computing accounting for both spatial and price competition among public cloud providers. We introduce a mixed logit demand model of spatial competition estimable with detailed data of a single firm but only aggregate sales data of a second. We leverage the EM algorithm to tackle the customer level missing data problem of the second firm. Estimation results and counterfactuals show that standard spatial competition economics hold even when distances for cloud latency is trivial.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Essays in Labor Economics*
Dissertation Committee: Kevin Lang, Daniele Paserman, James Feigenbaum

M.A., Political Economy, Boston University, Boston, MA, 2018

B.S.F.S., International Economics (*Magna Cum Laude*), Georgetown University,
Washington, DC, 2012

FIELDS OF INTEREST

Labor Economics, Public Economics

WORKING PAPERS

“The Big House Far From Home: Spatial Distance and Criminal Recidivism,” October 2020.
Job Market Paper.
“Who Married, (to) Whom, and Where? Trends in Marriage in the United States 1850-1940”
(with Claudia Olivetti, Daniele Paserman, and Laura Salisbury), September 2020.
“Rural Prisons as Place-Based Policies,” October 2020.
“Weak-Instrument Robust Inference for Two Sample Instrumental Variables Regression: A
Comment” (with Claudia Olivetti and Daniele Paserman), March 2020.

WORK IN PROGRESS

“The Gender Bonus Gap: Evidence from Young American Workers”
“Gender Composition and Voting Strategies in U.S. City Councils” (with Jesse Bruhn and
Thea How-Choon)

PRESENTATIONS

Society of Economics of the Household (2019)

FELLOWSHIPS AND AWARDS

Summer Research Grant, Boston University, Department of Economics, 2018
Best Second Year Paper Award, Boston University, Department of Economics, 2017
Dean’s Fellowship, Boston University, 2015

WORK EXPERIENCE

Research Assistant to Claudia Olivetti and Daniele Paserman, Boston University and NBER,
Summer 2017 - Spring 2020

Senior Analyst, Cornerstone Research, Washington, DC, 2014-2015

Analyst, Cornerstone Research, Washington, DC, 2012-2014

REFeree EXPERIENCE

Review of Economics of the Household

TEACHING EXPERIENCE

Instructor, Gender and Economics, Department of Economics, Boston University, Fall 2020

Teaching Fellow, Gender and Economics, Department of Economics, Boston University,
Fall 2019

Teaching Fellow, Introductory Microeconomic Analysis, Department of Economics, Boston
University, Fall 2016 and Spring 2017

Teaching Assistant, International Finance, Department of Economics, Georgetown
University, Fall 2010, Fall 2011, and Spring 2012

DEPARTMENTAL SERVICE

Organizer, BU Labor Reading Group, Fall 2017-Spring 2019

COMPUTER SKILLS: Stata, R, SAS, LaTeX

CITIZENSHIP: USA

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E. ANNA WEBER

The Big House far from Home: Spatial Distance and Criminal Recidivism (Job Market Paper)

Using data from the National Corrections Reporting Program, I estimate the causal effect of offenders' distance from home during incarceration on recidivism. To overcome the absence of data covering inmates' facility assignments and the potential endogeneity of facility assignment to recidivism propensity, I employ a novel two-sample instrumental variables strategy. I instrument for an inmate's distance from home with the average or minimum distance to state facilities from their home county, and combine the NCRP with cross-sectional data from Florida and Oklahoma containing inmate facility assignments for the current inmate population. My results suggest that doubling an inmate's distance from home decreases the probability of reincarceration in the same state within one year by 3 percentage points. Finally, I consider alternative outcomes and heterogeneous treatment effects to shed light on potential mechanisms. My results suggest that the deterioration of social ties, the breaking of criminal ties, and deterrence all contribute to a relationship between distance and later recidivism.

Rural Prisons as Place-Based Policies

I employ a generalized difference-in-difference strategy to provide causal evidence of the efficacy of prisons as place-based policies promoting rural employment in the United States from 1980-2015. The dominant employment effect of a prison opening or closure is a one-for-one gain or loss in public sector jobs. In the private sector, particularly large prisons opened in the 1990s may have crowded out manufacturing employment when sited in particularly small counties, and some private healthcare jobs directly serving prisons have also been lost upon recent closures. Besides these very specific effects, prisons do not appear to exert a local multiplier effect the hosting county; employment in other private sector industries is unaffected by prison opening or closure. I also find no evidence of a change in the county's non-prisoner population. Overall, these results suggest that prisons, and thus potentially other local public employment stimuli, have little utility as a local development strategy. More optimistically, recent prison closures do not appear to be responsible for local economic declines.

The Gender Bonus Gap: Evidence from Young American Workers

In this paper, I document the empirical relationship between performance pay and the gender wage gap in the US and consider several potential explanations for performance pay's relevance for the wage gap. Using data from the NLSY97, I find that women are less likely to be in a performance pay job, earn performance rewards less often within such jobs, and even in their baseline wage experience a smaller earnings increase from participation in performance pay jobs. These findings are not consistent with differences in the taste for competition alone explaining the gender difference in performance pay. I consider bias in subjective evaluation as one alternative explanation, with limited success in explaining empirical findings. Interpretation may be complicated by the potential for performance pay to be correlated with other workplace characteristics. In particular, bonus-awarding jobs demonstrate a higher elasticity of earnings with respect to weekly hours than other jobs, suggesting performance pay may be a feature of the relationship between long weekly hours and the gender wage gap.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Committee: Raymond Fisman, Martin Fiszbein and Dilip Mookherjee

B.Sc., Mathematics and Economics (*First Class Honor*), Hong Kong University of Science and Technology, Hong Kong PRC, China, 2015

FIELDS OF INTEREST

Applied Microeconomics, Development Economics, Political Economy

WORKING PAPERS

“Readers vs Owner? What Drives U.S. Media Attention on China during the Sino-US Trade Conflict”, September 2020 (Job Market Paper)

“Checks and Balances: Media criticism in China”, September 2020

WORK IN PROGRESS

“The Value of International Allies” (joint with Giovanna Marcolongo)

“State Ownership and R&D Efficiency: Evidence from Chinese Public Firms” (joint with Yang Ming)

“Image of Countries: A Cross-National Comparison of Media Coverage during the Covid-19 Pandemic” (joint with Taosong Deng)

“Spillover Effects of Anti-Corruption Campaign in China” (joint with Xiangyu Feng)

FELLOWSHIPS AND AWARDS

Dean’s List, Hong Kong University of Science and Technology, 2013-2015

WORK EXPERIENCE

Co-organizer, Reporter and Editor, Boston University Alumni Association of China & Xtecher, 2017

Internship Analyst, BGI Group & UCLA & HKUST, 2013

TEACHING EXPERIENCE

Teaching Fellow (Lab Instructor), Econometrics Analysis II, Department of Economics, Boston University, Spring 2020

Teaching Fellow (Lab Instructor), Intermediate Microeconomic Analysis, Department of Economics, Boston University, Fall 2018

Teaching Fellow, Introductory Macroeconomic Analysis, Department of Economics, Boston University, Spring 2018

Teaching Fellow, Introductory Macroeconomic Analysis, Department of Economics, Boston University, Fall 2017

LANGUAGES

English (fluent), Mandarin (native), Cantonese (working knowledge)

COMPUTER SKILLS: R, Stata, Python, Matlab

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Readers vs Owner? What Drives U.S. Media Attention on China during the Sino-US Trade Conflict (Job Market Paper)

In the past two years, the Sino-US relation has been through a volatile period due to trade conflicts. At the same time, there is extensive heterogeneity in the coverage on China by the U.S. media, both in terms of intensity and topics. What drives media attention on China as the U.S.'s diplomatic relation with her changes? In this paper, I use President Donald Trump's tweets as indicators of diplomatic relation changes, and I use the coverage by local daily newspapers to separate the effects from the demand (the readers') side and the supply (the owner's) side. I find that on average, a local newspaper's coverage on human rights and ideological issues of China responds to the President's tweets, and the response is driven by its owner's political leaning. The more democratic-leaning (republican-leaning) its owner is, the more a paper covers human rights and ideological issues when Sino-US relationship gets better (worse). On the other hand, such pattern is barely true for the coverage on the trade conflict itself. In contrast, the average political preference of newspapers' readers has little consistent effect. My study sheds light on the potential concerns of media independence in the United States when it comes to coverage on foreign countries.

Checks and Balances: Media Criticism in China

I study how political competition among provincial officials affects media criticism in China. I collect news reports by local mouthpiece outlets that criticize the provincial governments from 2004 to 2017. By exploiting the randomness of the pairing of the provincial governor and secretary, I prove that higher competition induces more criticism. I find that if a pair is assigned such that their promotion periods overlap, then during the overlapped period it is more likely to observe critical reports. I construct a model to illustrate how competition can be generated by promotion pressure. Intuitively, when both officials go through promotion examination, the economic signal from each individual cannot be observed separately, and media coverage serves as an additional signal to reveal their types.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Essays on Macroeconomics and Asset Pricing*
Main advisor: Marianne Baxter

M.S., Finance, Washington University in St. Louis, St. Louis, MO, 2013

B.A., Economics, Peking University, Beijing, China, 2012

B.S., Mathematics, Beijing Jiaotong University, Beijing, China, 2012

FIELDS OF INTEREST

Macroeconomics, Asset Pricing, International Economics

WORKING PAPERS

“Labor Adjustment Cost: Implications from Asset Prices,” October 2020, Job Market paper.
“The Human Capital Quantity CAPM,” October 2020.

WORK IN PROGRESS

“Reasonable Risk Aversion” (joint with Marianne Baxter)
“The Hours Premium in U.S. Asset-Pricing”
“Firm-Level Political Risk in China”

TEACHING EXPERIENCE

Instructor, Introductory Macroeconomic Analysis, Department of Economics, Boston University, Summer 2018, Summer 2019
Teaching Assistant, Empirical Economics, Department of Economics, Boston University, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Spring 2020
Teaching Assistant, Introductory Macroeconomic Analysis, Department of Economics, Boston University, Spring 2019

WORK EXPERIENCE

Research Assistant for Marianne Baxter, Boston University, Summer 2018, Fall 2018, Summer 2019, Fall 2019, Summer 2020, Fall 2020
Research Assistant for George-Levi Gayle, Washington University in St. Louis, Fall 2014, Spring 2015

Financial Analyst, Arch Grants, St. Louis, MO, 2014

Risk Management Consultant, Wells Fargo Advisors, St. Louis, MO, 2013

FELLOWSHIPS AND AWARDS

Dean's Fellowship, Boston University, 2015-2020

Outstanding Undergraduate Student Award, Beijing Jiaotong University, 2012

Outstanding Student Leadership Award, Beijing Jiaotong University, 2012

LANGUAGES

Chinese (native), English (fluent)

COMPUTER SKILLS

MATLAB, Python, STATA, LaTeX

CITIZENSHIP/VISA STATUS

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DONGWEI XU

Labor Adjustment Cost: Implications from Asset Prices (Job Market Paper)

This paper studies the macroeconomic and asset pricing implications arising from the labor adjustment cost. I implement a novel crosswalk linking three micro-level datasets and measure the hours margin of a firm's labor input. At the firm level, a 1 percentage point increase in hours growth is associated with a 0.6 percentage point decrease in future annual equity return. A production-based asset pricing model incorporating non-convex, linear, and convex labor adjustment cost components matches key moments of real quantities and asset prices. Consistent with the data, the model implies that firms face labor adjustment cost mostly in the form of production disruption, 20% of which occurs along the hours margin. I use the model to empirically measure a macroeconomic shock that reduces labor adjustment cost. Consistent with the model, the data suggests a negative price of such shock. Therefore, firms adjusting hours more produce more consumption goods in high marginal utility states and earn lower equity returns in equilibrium.

The Human Capital Quantity CAPM

If the labor income is the dividend from human capital value, then the labor hours is the dividend from human capital quantity (HCQ). This paper proposes a novel economic mechanism that matches the procyclical labor hours and countercyclical risk premium. When utility is nonseparable between HCQ and consumption, the equilibrium stochastic discount factor (SDF) increases in the HCQ-consumption ratio. Structural estimation of the model matches U.S. postwar macroeconomic data, and the SDF implied linear factor model explains 90% of the cross-sectional variation in Fama-French portfolios. Overall, my results suggest that HCQ-consumption ratio is an important macroeconomic risk factor.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Essays on nonlinear filtering with applications in finance*
Dissertation Committee: Zhongjun Qu, Pierre Perron and Jean-Jacques Forneron

M.S., Economics, University of Wisconsin, Madison, WI, 2015

M.A., Economics, Hitotsubashi University, Tokyo, JAPAN, 2012

B.A., Japanese, Xi'an International Studies University, Xi'an, CHINA, 2008

FIELDS OF INTEREST

Econometrics, Empirical Finance

PUBLICATIONS

“Constructing Employment and Compensation Matrices and Measuring Labour Input in China,” (with Harry X. Wu, and Ximing Yue) *RIETI Discussion Papers*, 2015, 15-E-005

WORKING PAPERS

“Quasi Monte Carlo Kalman Filter for Nonlinear and Non-Gaussian State Space Models,”
Job Market Paper, July 2020.

“Pairs Trading with Nonlinear and Non-Gaussian State Space Models,” *submitted*, June 2020.

“Hermite Polynomial-Based Valuation of American Options with General Jump-Diffusion Processes,” (with Li Chen), July 2020.

WORK IN PROGRESS

“Spot-future Arbitrage and Market Efficiency: a Quantamental Approach”

“Generalized Finite Mixture Approximations of Transition Densities of Jump Diffusions”

“Generalized Finite Mixtures and Option Pricing”

“Maximum Likelihood Estimation and Inference of Discretely Sampled Regime Switching Diffusions: with an Application to Treasury Bill Rates Data,” (with Anlong Qin and Li Chen)

“Pricing of American Options under Stochastic Volatility Models Using the Unscented Kalman filter”

“An Ant Colony Optimization Approach to the Valuation of American Options”

“A k -means Clustering Estimator for Nonparametric GARCH Models”

PRESENTATIONS

BU-BC Joint Econometrics Workshop, Boston, MA, 2019

FELLOWSHIPS AND AWARDS

Dean's Fellowship and Teaching Fellowship, BU, 2015-2020

WORK EXPERIENCE

Research Assistant for Professor Pierre Perron, Department of Economics, Boston University,
Fall 2017 - Spring 2019, Fall 2020

Research Assistant for Professor Zhongjun Qu, Department of Economics, Boston University,
Fall 2019 - Spring 2020

REFeree EXPERIENCE

Journal of Econometric Method

TEACHING EXPERIENCE

Teaching Assistant, Department of Economics, BU

EC303/304 Empirical Economic Analysis (BA level), Spring 2017, Fall 2019

EC203/204 Empirical Economics (BA level), Fall 2016

LANGUAGES

Mandarin (native)

English (fluent)

Japanese (fluent)

COMPUTER SKILLS: Python, R, C++, JavaScript, MATLAB, Stata, LaTeX

CITIZENSHIP/VISA STATUS: China/F1

REFERENCES

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Quasi Monte Carlo Kalman Filter for Nonlinear and Non-Gaussian State Space Models (Job Market Paper)

In this study, we present a new filtering approach for nonlinear and non-Gaussian state space models. This approach builds on the well-established Kalman filter, featuring a state-dependent least-square linearization of the nonlinear function and a Gaussian-mixture approximation to the error distribution, and it applies the quasi Monte Carlo method for numerical integration during the computation. We compare our approach with other existing methods using simulated data, and we find that the proposed approach can outperform these methods in terms of speed and accuracy. This study also provides analysis on the stability of this new filtering approach. In addition, we propose two methods to estimate the unknown parameters, and establish the consistency of the proposed quasi-maximum likelihood estimator under general conditions. To illustrate the proposed approach, we discuss several numerical examples. We also consider two empirical applications. The first is a stochastic volatility model for foreign exchange data between Sterling and Dollar. The second is a jump model for the 3-month T-bill rate data, where we show that the jump size has a Gaussian mixture representation. We estimate the jump probability and investigate the jump sources based on macroeconomic events.

Pairs Trading with Nonlinear and Non-Gaussian State Space Models

This study examines pairs trading using a nonlinear and non-Gaussian state space model framework. We model the spread between the prices of two assets as an unobservable state variable, and assume that it follows a mean-reverting process. This new model has two distinctive features: the (1) non-Gaussianity and heteroscedasticity of the innovations to the spread, and (2) nonlinearity of the mean reversion of the spread. We show how to use the filtered spread to carry out statistical arbitrage. We also propose a new trading strategy and present a Monte Carlo-based approach to select the optimal trading rule. For empirical applications, we first apply our approach to two examples: PEP vs. KO and EWT vs. EWH, and show that the new approach can achieve 21.86% (31.84%) annualized return for the PEP-KO (EWT-EWH) pair. Then, we consider all the possible pairs among the five largest and the five smallest U.S. banks listed on the NYSE. For these pairs, we compare the performance of the proposed approach with that of the existing popular approaches, both in-sample and out-of-sample. We find that our approach can significantly improve the return and the Sharpe ratio.

Hermite Polynomial-Based Valuation of American Options with General Jump-Diffusion Processes (with Li Chen)

We present a new approximation scheme for the price and exercise policy of American options. The scheme is based on Hermite polynomial expansions of the transition density of the underlying asset dynamics and the early exercise premium representation of the American option price. The advantage of the proposed approach is threefold. First, our approach does not require the transition density and characteristic functions of the underlying asset dynamics to be attainable in closed form. Second, our approach is fast and accurate, while the prices and exercise policy can be jointly produced. Third, our approach has a wide range of applications. We show that the proposed approximations of the price and optimal exercise boundary converge to the true ones. We also provide a numerical method based on a step function to implement our proposed approach. Applications to nonlinear mean-reverting models, double mean-reverting models, Merton and Kou's jump-diffusion models are presented and discussed.

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)
Dissertation Title: *Essays on Dynamic Contracts*
Dissertation Committee: Barton Lipman, Juan Ortner, and Chiara Margaria

B.S., Mathematics, Peking University, Beijing, China, 2015

B.A., Economics, Peking University, Beijing, China, 2015

FIELDS OF INTEREST

Microeconomic Theory, Contract Theory

WORKING PAPERS

“Dynamic Incentive Provision When Evaluation Takes Time,” September 2020. Job Market paper.
“Screening under Fixed-wage Employment,” September 2020.

WORK IN PROGRESS

“Dynamic Delegation with Adverse Selection”

PRESENTATIONS

The 6th World Congress of the Game Theory Society, Budapest, Hungary, 2021 (scheduled)
The 30th Stony Brook International Conference on Game Theory, Stony Brook, NY, 2019

FELLOWSHIPS AND AWARDS

Dean’s Fellowship, Boston University, Fall 2015- Spring 2020
Summer Research Grant, Boston University, Summer 2019
Silver Medalist of China Mathematical Olympiad (CMO), 2010 and 2011

TEACHING EXPERIENCE

Teaching Assistant, Microeconomic Theory (Ph.D. core), Department of Economics, Boston University, Fall 2016 - Spring 2020

LANGUAGES

English (fluent), Mandarin Chinese (native)

COMPUTER SKILLS: MATLAB, R, LaTeX

CITIZENSHIP/VISA STATUS: China/F1

REFERENCES

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Professor Chiara Margaria

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Dynamic Incentive Provision When Evaluation Takes Time (Job Market Paper)

In a principal-agent relationship, evaluation of the agent's performance may take time. For example, the value of a new product or new theory may not be immediately recognized when it is first introduced. Side effects of a new drug could be learned after many years of use. Similarly, the performance of a new trading strategy needs to be tested under different market conditions, which may take a long time. In this paper, I study a continuous-time principal-agent model in which the principal evaluates the agent's performance over time after the agent stops working. Postponing payments comes with a delay due to the agent's relative impatience. Thus, the principal faces a trade-off between paying earlier with a less precise evaluation and paying later with a more precise evaluation. In the optimal contract, the principal never terminates the agent before a success or a failure. The optimal payment scheme features a combination of reward for success and compensation for failure. Both the reward and compensation are increasing over time. The reward is made with a delay after the agent stops working and the delay decreases over time. The agent gets better off as he stays longer in the relationship even before achieving a success.

Screening under Fixed-wage Employment

An agent's performance is jointly determined by his ability and his effort. To induce the agent to work hard, the principal would ideally punish the agent when he has a bad performance due to lack of effort instead of lack of ability. In addition, the principal is more willing to hire an agent with higher ability. When both effort and ability are unobservable, however, it is unclear how to incentivize the agent. In this paper, I study a dynamic principal-agent model where the wage is fixed and the principal chooses when to fire the agent conditional on the history of performance. In each period, the high type has a higher probability of getting a good outcome if he exerts effort. The principal observes the outcome in each period but does not observe the agent's type or effort. I show that in the optimal contract, the principal hires the high type for sure and hires the low type with some probability. But conditional on being hired, the low type's contract is more preferred by both types. The optimal contract is reminiscent of the two-track system in most Chinese universities, where the tenure-track faculty receives a higher wage but also faces a higher requirement. On the other hand, the non-tenure-track faculty receives a lower wage but is very unlikely to be fired.

Dynamic Delegation with Adverse Selection

Delegated decision making is commonly observed in many economic activities. Within an organization, headquarters may delegate to division managers who have better information but also a different objective. The relationship is usually ongoing and the conflict of interest can be persistent. In this paper, I study a dynamic principal-agent model where the principal decides whether to delegate to the agent or not in each period. The agent always wants to be delegated and has a different preferred action. Whether the agent is able to choose the principal's preferred action depends on his ability to acquire information. When the ability is common knowledge, I show that the agent is best off when his ability is not too high or too low. When the ability is private information, the optimal contract features pooling at the top, where the principal offers a same contract to agents with a high ability.

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EDUCATION

Ph.D. in Economics, Boston University, May 2021 (expected)

Dissertation Title: *Public Policy and Vertical Relationship in Healthcare Market*

Main advisors: Randall P. Ellis, Marc Rysman

M.A. in Economics, Boston University, 2015

M.Sc. in Applied Mathematics and Industrial Science, Ecole Centrale de Lyon, 2014

M.Eng. in Control Science and Engineering, Beihang University, 2014

B.Sc. in Information and Computational Science, Beihang University, 2011

FIELDS OF INTEREST

Health Economics, Industrial Organization

WORKING PAPERS

“The Effect of Medical Loss Ratio Regulation on Insurer Pricing,” (Job Market Paper), October 2020.

“Higher Medicare Spending on Imaging and Lab Services After Physician Practice Vertical Integration,” with Michael Richards, Cheryl Damberg, Christopher M. Whaley (R&R – Health Affairs), June 2020.

“The Extent of Externalities from Medicare Payment Policy,” with Alice Chen, Michael R. Richards, Christopher M. Whaley (under review) [\(RAND WP version\)](#), August 2020.

“Health Care Demand Elasticity by Types of Cost Sharing,” with Chenlu Song, November 2019

“Delay in Mental Health Treatment for Children with Medical Complexity,” with Christopher J. Louis, Sara S. Bachman, Meg Comeau, Allyson Baughman, Sean Lynch, Yiyang Yuan, Randall P. Ellis (under review), May 2020

WORK IN PROGRESS

“Care Coordination across Firm Boundaries: Assessing the Role of Provider Organization,” with Leila Agha and Keith Ericson

“The Effect of Vertical Integration on Physicians’ Referral Pattern for Surgical Procedures,” with Christopher M. Whaley

“Participation in Health Insurance Exchange Marketplaces”

“Heterogeneity of Income Effect on Benefit Distribution of Social Health Insurance: Evidence from China”

PUBLICATIONS

Min, Bonan, and Xiaoxi Zhao, “Measure Country-Level Socio-Economic Indicators with Streaming News: An Empirical Study.” *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)*. 2019, pp. 1249-1254.

[Global Hospital Management Survey - China, Management in Healthcare Report](#), 2015

Leng, Biao, Xiaoxi Zhao, and Zhang Xiong, “Evaluating the Evolution of Subway Networks: Evidence from Beijing Subway Network.” *EPL (Europhysics Letters)* 2014, 105(5).

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Zhao, Xiaoxi. “Analysis of The Major Factors Affecting Macao’s Economy,” *2012 International Conference on Management Science Engineering 19th Annual Conference Proceedings*, 2012, pp.970-976

RESEARCH EXPERIENCE

Adjunct Researcher, Economics, Sociology and Stats, RAND Corporation, Jan 2020 - present
Summer Associate, Economics, Sociology and Stats, RAND Corporation, Summer 2019
Research Assistant to Leila Agha and Keith Ericson, NBER, Jan 2019 - June 2020
Research Assistant to Sara S. Bachman, Boston University, 2017-2018
Research Assistant to Jordi Jaumandreu, Boston University, Spring 2015
Research Fellow, China Center for Health Economics Research, Peking University, 2013-2014
Trainee Analyst, Creativ-Ceutical Consulting Company, 2012

TEACHING EXPERIENCE

Teaching Assistant, Statistics for Economists (graduate-level), Department of Economics, Boston University, Fall 2016, Fall 2017
Teaching Assistant, Market Structure and Industrial Organization (graduate-level), Department of Economics, Boston University, Spring 2017

FELLOWSHIPS AND AWARDS

Special Summer Stipend, Boston University	2016
Dean’s Fellowship, Boston University	2015 - 2016
Young Health Economist Fellowship, Peking University	2013 - 2014
China National Scholarship for Graduate Student	2012

LANGUAGES

Mandarin (native), English (fluent), French (professional working proficiency)

COMPUTER SKILLS

Python, MATLAB, SAS, STATA, R

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The Effect of Medical Loss Ratio Regulation on Insurer Pricing (Job Market Paper)

The Affordable Care Act Medical Loss Ratio (MLR) regulations set a minimum requirement on the ratio of medical spending to premium revenue, with the goal of limiting insurer profits. However, this regulation also undermines the incentives for insurers to bargain for lower prices when negotiating prices with health care providers. In this paper, I build a bargaining model of how the MLR constraint affects price negotiation between insurers and providers. This model illustrates the insurer tradeoff between lower premiums and higher service prices and reveals how bargaining for lower prices is reduced. Predictions from the model are tested in a structural model of MLR regulation on negotiated prices and insurers' costs using data from the individual Health Insurance Exchange Marketplace. Estimated demand, cost, and bargaining parameters are then used to calculate welfare effects, which suggest that the MLR regulation led to a 7.6% increase in health service prices.

The Impact of Organizational Boundaries on Healthcare Coordination and Utilization

(with Leila Agha and Keith Marzilli Ericson)

Patients often receive healthcare from providers spread across different firms. Coordinating across organizational boundaries introduces frictions, but we do not know how this impacts healthcare. We define and measure *organizational concentration*: the distribution across organizations of a patient's healthcare. Medicare claims show that organizational concentration varies substantially across physicians and regions, and that patients who move to more concentrated regions have lower healthcare utilization. Our main identification strategy examines patients whose PCPs exit the local market, and instruments for their change in concentration via mean reversion. Patients who switch to a PCP with 1 SD higher organizational concentration have 11% lower healthcare utilization. This finding is robust to controlling for patients' number and types of providers seen. Increases in organizational concentration have no detectable effect on ED utilization or hospitalization, but do predict improvements in diabetes care.

The Effects of Physician Vertical Integration on Referral Patterns, Patient Welfare, and Market Dynamics

(with Christopher M. Whaley)

Vertical integration between physicians and hospitals is an increasingly common feature in the health care provider market. It raises concerns about distorted referral patterns, higher spending, and market foreclosure. In this paper, we use 100% Medicare fee-for-service data to assess how physician-hospital integration affects patients' choices for outpatient surgical procedures. We combine reduced-form analysis with a nested-logit discrete choice model to estimate the effect of primary care physician groups' vertical integration on patients' provider choices and welfare. Our estimates suggest that physician-hospital integration results in a 2.5 to 7 percentage points increase, depending on procedures, in the probability of referring patients to hospitals. Our welfare results imply that if all the PCPs become integrated, patients will pay \$38 million more out-of-pocket payment, and the total spending will increase by \$191 million for the two procedures. Vertical integration does not have a significant effect on the quality of procedures. Our analysis of the market structure shows that ten percentage points increase in the integration rate translate into 16 to 19 points increase in the HHI measure of PCP market concentration.