MIT Economics

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DOCTORAL STUDIES

Massachusetts Institute of Technology (MIT)
PhD, Economics, Expected completion June 2023
DISSERTATION: "*Essays in Market Design and Political Economy*"

DISSERTATION COMMITTEE AND REFERENCES

Parag Pathak
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Glenn Ellison
MIT Department of Economics
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PRIOR EDUCATION

Koc University 2017
M.A. in Economics

Koc University 2016
B.A. in Economics, Valedictorian

CITIZENSHIP Turkey

GENDER: Male

LANGUAGES Turkish, English

FIELDS Primary Fields: Theory, Market Design

Secondary Fields: Political Economy

TEACHING EXPERIENCE

14.283-284 Topics in Organizational Economics I & II (Graduate) 2022
Teaching Assistant to Juan Ortner and Charles Angelucci

14.121 Microeconomic Theory I (Graduate) 2021
Teaching Assistant to Parag Pathak
14.12 Game Theory (Undergraduate)
Teaching Assistant to Ian Ball
14.773 Political Economy II (Graduate)
Teaching Assistant to Daron Acemoglu and Leopoldo Fergusson

14.121 Microeconomic Theory I (Graduate) 2020
Teaching Assistant to Parag Pathak
14.125 Market Design (Graduate)
Teaching Assistant to Parag Pathak
14.770 Introduction to Political Economy (Graduate)
Teaching Assistant to Abhijit Banerjee and Elias Papaioannou

14.770 Introduction to Political Economy (Graduate) 2019
Teaching Assistant to Ro'ee Levy and Ben Olken
14.122 Microeconomic Theory II (Graduate)
Teaching Assistant to Glenn Ellison

FELLOWSHIPS, HONORS, AND AWARDS

Unicredit & Universities Crivelli Europe Scholarship (2017)
The Scientific and Technological Research Council of Turkey Scholarship for Graduate Studies (2016)
Valedictorian, Koc University (2016)

PROFESSIONAL ACTIVITIES

Presentations
2022: Iowa State University, INFORMS Workshop on Market Design, Society for the Advancement of Economic Theory Conference
2021: London Business School

Refereeing
AEJ:Microeconomics, The Review of Economic Studies

PUBLICATIONS

"Priority Design in Centralized Matching Markets" (with Joel Flynn)
The Review of Economic Studies, May 2022, 89(3): 1245-1277.

In many centralized matching markets, agents' property rights over objects are derived from a coarse transformation of an underlying score. Prominent examples include the distance-based system employed by Boston Public Schools, where students who lived within a certain radius of each school were prioritized over all others, and the income-based system used in New York public housing allocation, where eligibility is determined by a sharp income cutoff. Motivated by this, we study how to optimally coarsen an underlying score. Our main result is that, for any continuous objective function and under stable matching mechanisms, the optimal design can be attained by splitting

agents into at most three indifference classes for each object. We provide insights into this design problem in three applications: distance-based scores in Boston Public Schools, test-based scores for Chicago exam schools, and income-based scores in New York public housing allocation.

RESEARCH PAPERS

"Adaptive Priority Mechanisms" (Job Market Paper)
(with Joel Flynn)

How should authorities that care about match quality and diversity allocate resources when they are uncertain of the market they face? Such a question appears in many contexts, including the allocation of school seats to students from various socioeconomic groups with differing exam scores. We propose a new class of *adaptive priority mechanisms* (APM) that prioritize agents as a function of both scores that reflect match quality and the number of assigned agents with the same socioeconomic characteristics. When there is a single authority and preferences over scores and diversity are separable, we derive an APM that is optimal, generates a unique outcome, and can be specified solely in terms of the preferences of the authority. By contrast, the ubiquitous priority and quota mechanisms are optimal if and only if the authority is risk-neutral or extremely risk-averse over diversity, respectively. When there are many authorities, it is dominant for each of them to use the optimal APM, and each so doing implements the unique stable matching. However, this is generally inefficient for the authorities. A centralized allocation mechanism that first uses an aggregate APM and then implements authority-specific quotas restores efficiency. Using data from Chicago Public Schools, we estimate that the gains from adopting APM are considerable.

"Diversity Preferences, Affirmative Action and Choice Rules"

Many institutions implement affirmative action policies for hiring individuals or allocating resources, indicating a preference for diversity as well as match quality. I introduce a framework to analyze diversity preferences and their effect on the affirmative action policies and choice rules adopted by institutions. I characterize the choice rules that can be rationalized by diversity preferences and demonstrate that the rule used to allocate government positions in India cannot be rationalized. I show that if institutions evaluate diversity using marginal (*i.e.*, not cross-sectional) distribution of identities, then choices induced by their preferences cannot satisfy the substitutes condition, which is crucial for the existence of competitive equilibria and stable allocations. I characterize a class of choice rules that satisfy the substitutes condition and are rationalizable by preferences that evaluate diversity and quality separately and identify the preferences that induce some widely used choice rules. My framework and results provide a systematic way of evaluating the diversity preferences behind the choices made by institutions.

"Best-Response Dynamics in the Boston Mechanism"

I analyze a setting where the Boston Mechanism (BM) is applied repeatedly and students form their application strategies by best-responding to the admission cutoffs of the previous period, a process I call the Repeated Boston Mechanism (RBM). If students are truthful in the initial period, the allocation under RBM converges in finite time to the student optimal stable matching (SOSM), which is the Pareto-dominant equilibrium of BM and the outcome of the strategy-proof Deferred Acceptance Mechanism. If some students are sincere and do not strategize, then the allocation under RBM with sincere students converges to the SOSM of a market in which sincere students lose their priorities. When students best-reply to some initial cutoffs in the first period, RBM converges to SOSM if students are initially optimistic about their admissions chances but may cycle between allocations Pareto-dominated by SOSM if they are pessimistic. My results provide a foundation for equilibrium analysis under BM and help explain why students play suboptimal and overcautious strategies.

"International Unions and Integration"
(with Elias Papaioannou)

We consider a model of international unions in which countries have heterogeneous preferences for integration and their integration decisions are strategic complements. We analyze equilibrium under several integration protocols that differ in the flexibility countries have in choosing how much to integrate. Unlike previous models with strategic substitutes, our setting is in line with the evolution of the European Union (EU), where enlargement and flexible integration coincide with enhanced integration and are often spearheaded by the "core" countries. Moreover, when non-members (candidates, exiting countries, and other nations) can partially integrate with the union, as in practice, restrictions on their integration determine the union's size and scope and are necessary for fostering cooperation. Motivated by Brexit and the rise of euro-skepticism, we allow countries to leave the union and demonstrate how restrictions on the integration of leaving countries make the union robust to changes in members' preferences.

"Substitutability of Favors and Bilateral Enforcement of Cooperation"

I introduce a favor exchange model that allows players to rely on multiple partners to obtain favors (*i.e.*, cooperation is substitutable) and study bilateral enforcement of cooperation. Without substitutability, there is either no cooperation or universal cooperation, while under substitutability, each additional relationship is less valuable than the previous one and intermediate levels of cooperation are observed. I show that transfers facilitate cooperation but may exacerbate inequality when players are heterogeneous. I extend the model to allow for community and legal enforcement and characterize when each enforcement mechanism is optimal. In applications, I demonstrate how my model

can offer insights into the stratification of social networks in post-Soviet states and the adoption of different enforcement mechanisms by medieval traders.

"Segmented Trading Markets: Competition, Fees, and Tax Policies"
(with Kerry Back, Ali Kakhbod and A. Max Reppen)

We study the competition among segmented trading venues in which the venues differ in technology (fast vs. slow). Technological differentiation leads to higher trading fees but has an ambiguous impact on trading volumes. Improvements in the slow venue increase trading volumes, whereas improvements in the fast venue might increase or decrease it. We also study the welfare effect of tax policies. In equilibrium, the tax rate to optimize tax revenue depends only on trader preferences and is thus independent of the venue competition. With non-constant welfare weights, the aggregate welfare can be maximized at nontrivial tax rates.