MIT Blueprint Labs Launch Preview

July 30, 2021
1:00 – 2:00 pm ET

Blueprint Labs

Agenda

- **Opening Remarks**
  - Agustín Rayo, Dean, MIT School of Arts, Humanities, and Social Sciences
  - Glenn Ellison, Department Head, MIT Economics
- **About Blueprint Labs**
  - Background
  - Mission
  - Leadership & staff
- **Research Spotlights**
  - Higher Education and the workforce
  - K-12 education
  - Health care
- **Future projects & Next Steps**

Blueprint Labs

Welcome & Introduction

Agustín Rayo
Dean, MIT School of Humanities, Arts, and Social Sciences
Professor of Philosophy, MIT

Blueprint Labs

Opening Remarks

Glenn Ellison
Department Head, MIT Economics
Gregory K. Palm Professor of Economics, MIT

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About Blueprint Labs

Parag Pathak
Class of 1922 Professor of Economics, MIT
Faculty Director, MIT Blueprint Labs

Background

- **MIT School Effectiveness and Inequality Initiative (SEII)**
  - Josh Angrist, David Autor, and Parag Pathak
  - "Strengthening schools and skills through research"
  - Over ten years…
    - 18 faculty affiliates
    - 11 current full-time staff
    - 13 PhD students
    - 32 published studies
    - 142 media citations
- **Charter schools, college scholarships, school choice, exam schools, preschool, flipped classrooms, STEM programs, class size, and more**

Our Specialties

Research Design

- What is the impact of an intervention or policy?
- Statistical and econometric methods
- ~~Correlation~~ *Causal impact*

Market Design

- How can we efficiently and fairly allocate scarce resources?

These tools are useful for answering questions in a variety of fields, including education.

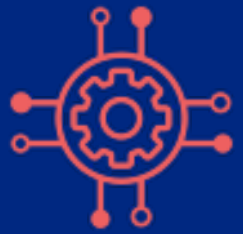
Our mission:

To use data, economics, and analytic tools to uncover the consequences of policy decisions and improve society.

Education

Health Care

Workforce



Leadership

- Nikhil Agarwal, Joshua Angrist, David Autor, Parag Pathak - Faculty
- Eryn Heying – Executive Director

11 full-time staff members

18+ faculty affiliates

13 PhD students

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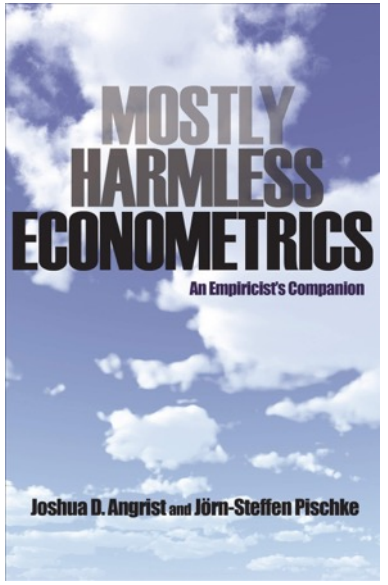
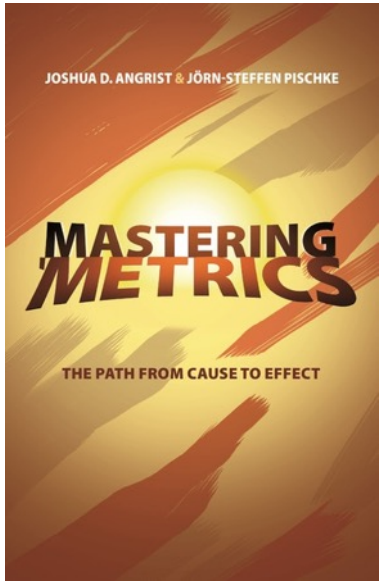
Effects of Merit Aid for Low-Income Students

Joshua Angrist
Ford Professor of Economics, MIT
Faculty Director, MIT Blueprint Labs

Joshua Angrist

- Ford Professor of Economics, MIT
- Research Associate, National Bureau of Economic Research
- Faculty Co-director, MIT Blueprint Labs
- *Legendary econometrics instructor*





Research Interests

- Economics of education and school reform
- Labor market regulation and institutions
- Effects of social programs
- Econometric methods and instruction

Background for Our Post-Secondary Aid Study

- In 2011, our newborn research team embarked on the largest and most ambitious randomized evaluation of post-secondary financial aid to date
    - Our study allocated aid to randomly chosen treatment and control groups

- Why study financial aid?
    - While college attainment has risen, gaps in degree completion by family income—already large—have widened
    - Trying to close these gaps, governments and private groups distribute billions in financial aid to low-income students

- Financial aid is meant to boost post-secondary schooling for aid recipients, thereby closing gaps in college completion by family income
    - MIT SEII/Blueprint Labs partnered with the Susan Thompson Buffett Foundation (STBF) to gauge whether and to what extent this goal is met

The STBF Scholarship Program

- STBF is one of the largest private funders of college scholarships in the country
- STBF awards cover the full cost of (public institution) tuition and fees; STBF distributes over $40 million in aid annually to more than 4,000 students
- Any Nebraska high school graduate is eligible to apply; award money can be put towards the cost of attending any public Nebraska college or university
- STBF award recipients enrolled on University of Nebraska (NU) campuses must participate in a student support intervention known as Learning Communities (LCs)

Research Questions

1. How do STBF awards affect the college enrollment decisions, dropout rates, and degree completion rates of scholarship recipients?

2. How do award effects differ across demographic and college-readiness subgroups? What mediating variables appear to explain differences in impact?

3. Are awards equally effective with or without LC participation?

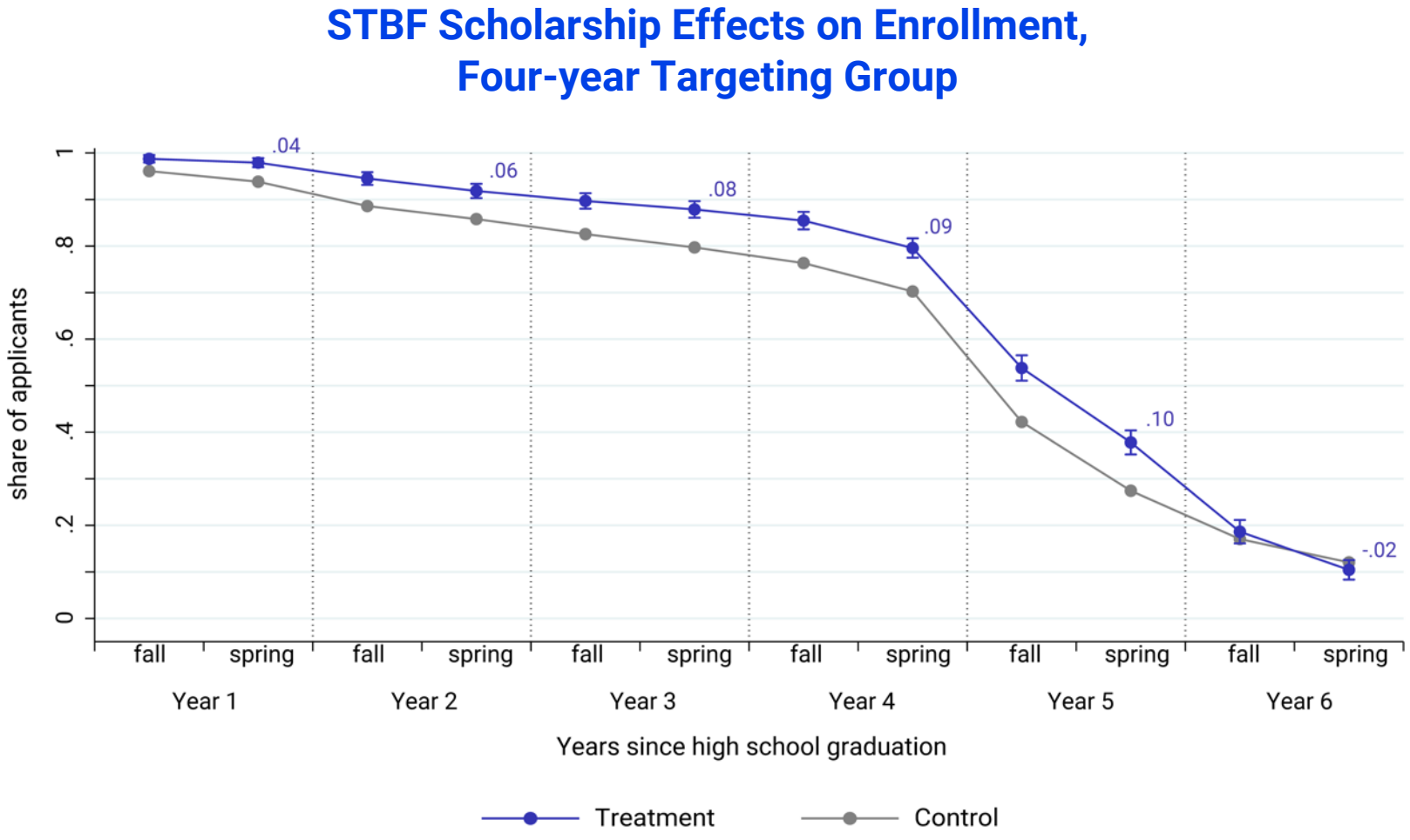
4. Comparing the large economic returns to college with award costs, for which groups are awards most likely to be cost-effective?

Finding #1: Scholarships Boost Postsecondary Enrollment and Persistence

- STBF selects scholarship recipients from two applicant groups: those targeting four-year degrees and those targeting two-year degrees

- STBF awards **increased enrollment** and **reduced dropout rates** in both groups

- But degree effects in the two-year group are modest and not statistically significant



Note: Share of applicants in the four-year target group enrolled in any postsecondary institution

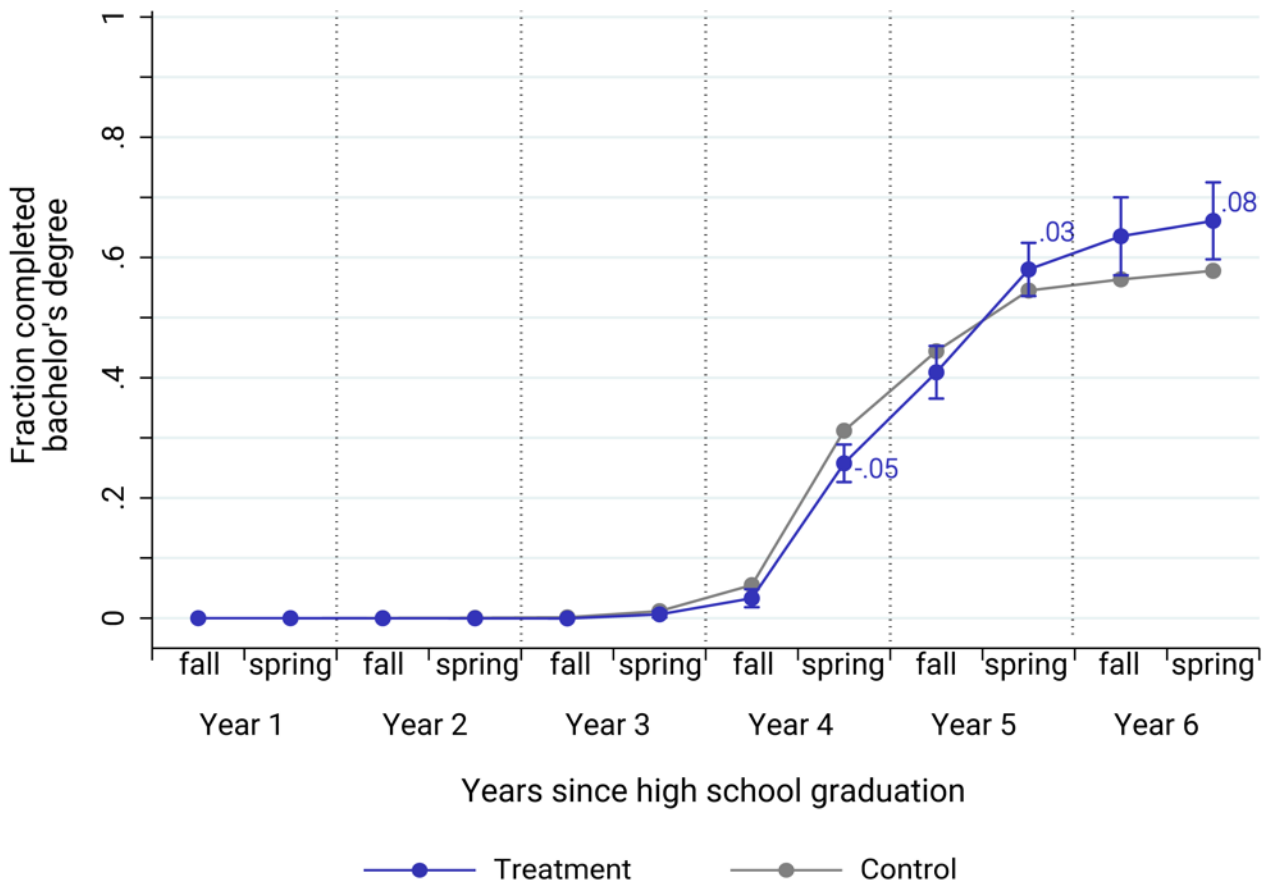
Finding #2: Scholarships Boost Bachelor's Degree Completion

- Four-year students with and without STBF awards complete BAs at the same rate until year five

- By year six, STBF awards increase BAs by **8.4 percentage points in the four-year group**

- **Degree effects are largest for disadvantaged students** and for those expected to be less likely to graduate:
  - Students with below-median ACT scores
  - Nonwhite students
  - Pell grant-eligible students
  - First generation college students

STBF Scholarship Effects on Bachelor's Degree Completion, Four-year Targeting Group



Note: Share of applicants completing a bachelor's degree in the four-year college group

Explanations and Implications

- Our analysis shows degree effects can be explained by *initial four-year engagement*: STBF award impact on degrees is proportional to STBF impact on four-year credit completion **in the first year after high school**

- **The paradox of merit aid**: award effects are modest or absent in groups with strong high-school achievement and high ACT scores, groups usually deemed worthy of support (and especially likely to qualify for the ”new merit aid” offered by state programs like Georgia HOPE)

- Degrees gains are expensive: with minimal targeting, most aid flows to applicants likely to complete college with or without this additional support. **Targeting improves the award cost-benefit calculus considerably**.

- Coming soon: Blueprint Labs study of financial aid effects on longer-run outcomes, including credit scores and earnings

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The Long-term Effects of Universal Preschool in Boston

Parag Pathak
Class of 1922 Professor of Economics, MIT
Faculty Director, MIT Blueprint Labs

Parag Pathak

- Class of 1922 Professor of Economics, MIT
- Founder and Co-director, the National Bureau of Economics Research (NBER) Working Group on Market Design
- Faculty Director, MIT Blueprint Labs

Research Interests

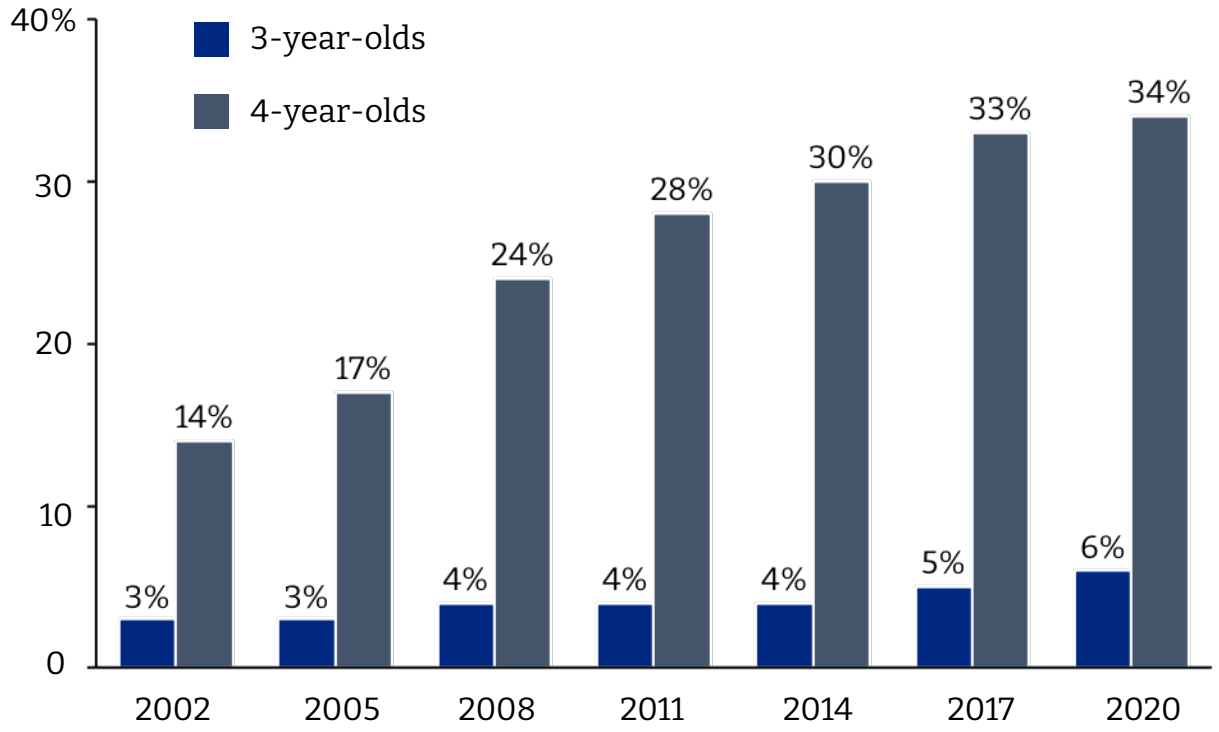
- K-12 education and urban economics
- Health care
- Market design and scarce resource allocation

Enrollment in state-funded preschool growing, but many lack access

- State-funded preschool enrollment has increased but a substantial number of students remain unserved
- Covid- induced enrollment declines in 2020-21 school year have been strongest at Pre-K

Percent of US population enrolled in state-funded preschool

2002-2020



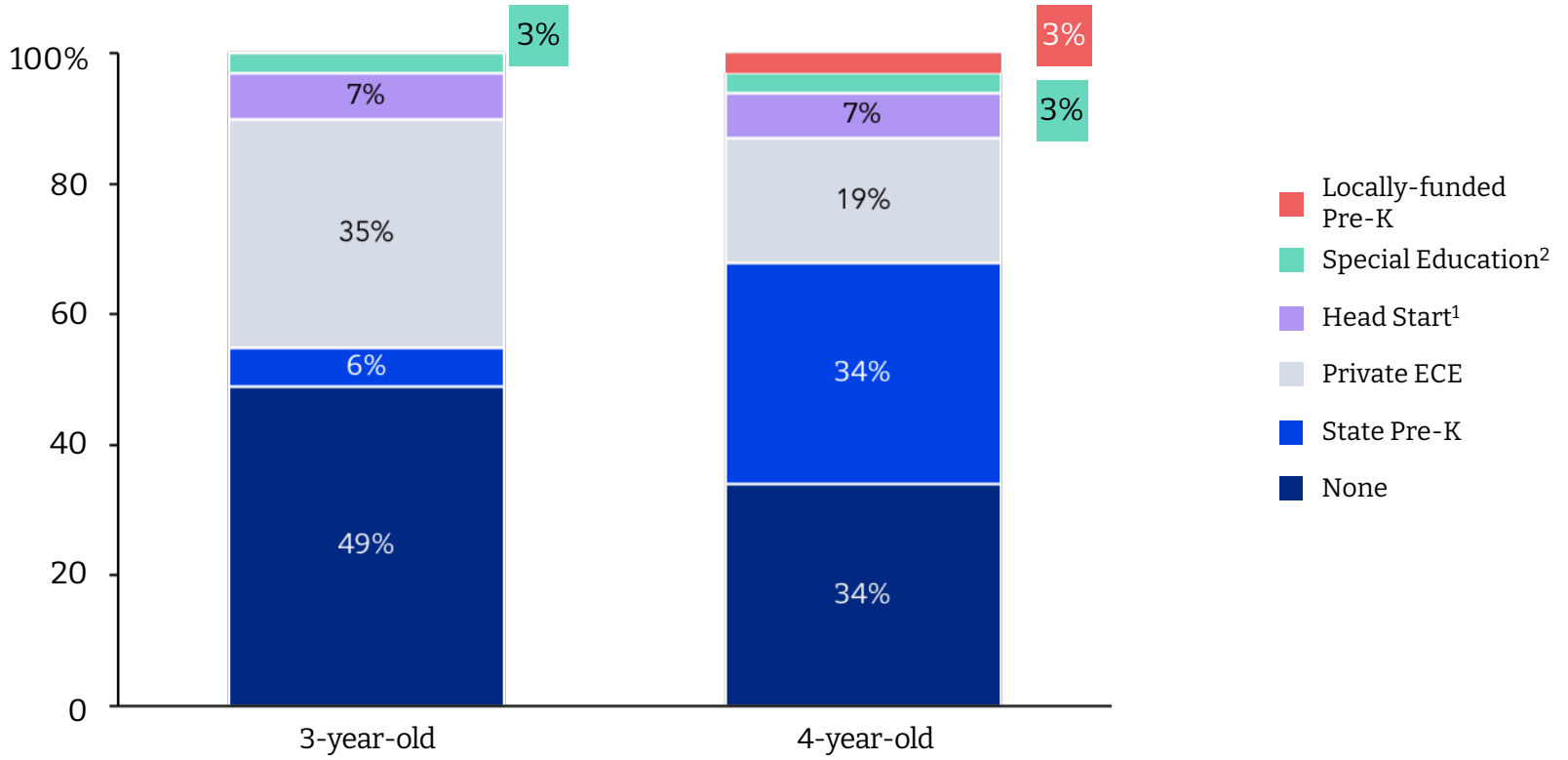
Notes: [1]Some Head Start children may also be counted in state pre-K. [2]Estimates children in special education not also enrolled in state pre-K or Head Start.
Source: National Institute for Early Education Research (NIEER) - The State of Preschool 2020 Report

Many three- & four-year olds not in early childhood programs

The NIEER Report indicates that **49% of three-year-olds and 34% of four-year-olds are not enrolled in ECE**. President Biden's proposal aims to create free universal preschool for all three- and four-year-olds.

Percent of US population enrolled in early childhood education by type

2020



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What are the impacts of pre-K in Boston?

1. What is the effect of preschool in Boston on:
    1. Short-run test scores,
    2. Student behavior, and,
    3. Long-run college outcomes?

2. Are the effects of preschool the same for all students? Should pre-K be universal or targeted to low-income applicants?

Boston's preschool lottery

- Study takes place between 1997-2003
- Boston Public Schools' public preschool program had more applicants than seats
- A lottery determined who of the ~4,000 applicants got a preschool seat and who did not
- Study compares the outcomes of applicants who randomly won a seat to those who did not win a seat

Findings

1. Public preschool in Boston boosted long-run educational attainment

2. The short-term impacts of preschool are evident in student behavior but not test scores

3. The benefits of preschool are larger for boys than girls, but do not differ by race and income

	Outcome	Impact of attending preschool	
Long-term educational attainment	Graduate high school	↑	**6** percentage points more likely
	Take the SAT	↑	**8.5** percentage points more likely
	Enroll in college on-time	↑	**8.3** percentage points more likely
	Ever enroll in college	↑	**5.4** percentage points more likely
Academic achievement	State standardized test scores	-	*No detectable impact*
	Repeat a grade	-	*No detectable impact*
Student behavior	Suspensions in high school	↓	**0.24** fewer suspensions
	Juvenile incarceration	↓	**0.8** percentage points less likely

Why this is important

- First **lottery-based** evaluation of a **large-scale modern-day** preschool program on **long-term outcomes**

- New evidence that large-scale and modern public preschool programs can improve educational attainment, playing a role in current policy debate about increased public investment in early childhood education

What's Next?

New sites

- Is the preschool effect similar in other settings and more recent years?
- What types of preschool programs are the most effective? How does this inform stated policy goals to scale public preschool access nationally?

Exploring a wider set of long-run outcomes

- Health, teen pregnancy, criminal justice, non-cognitive/behavioral, college, earnings, credit and debt

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Market Failure in Kidney Exchange

Nikhil Agarwal
Associate Professor of Economics, MIT
Faculty Co-director, MIT Blueprint Labs

Nikhil Agarwal

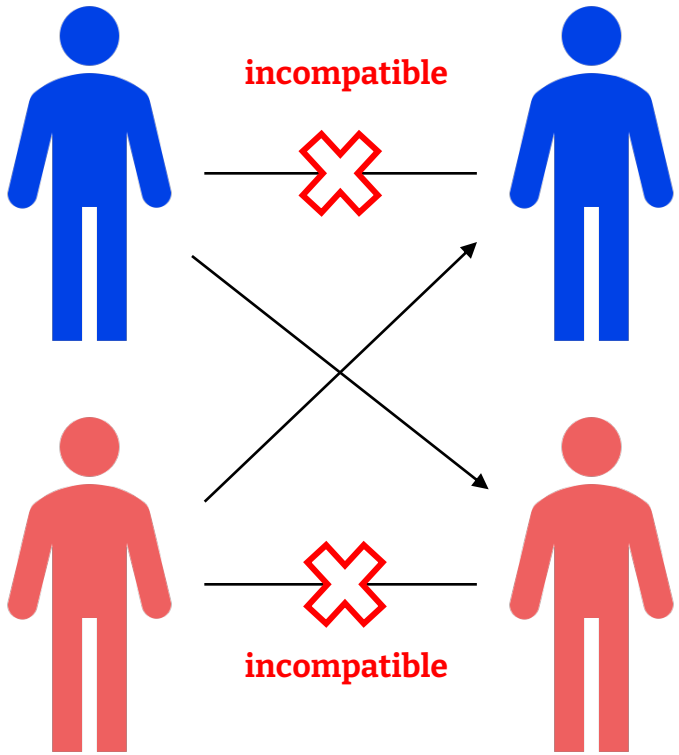
- Associate Professor of Economics, MIT
- Research Associate, National Bureau of Economic Research
- Faculty Co-director, MIT Blueprint Labs

Research Interests

- Health care
- Market design and scarce resource allocation
- **Design of AI systems in health care**

Challenges in Kidney Transplants & Allocation

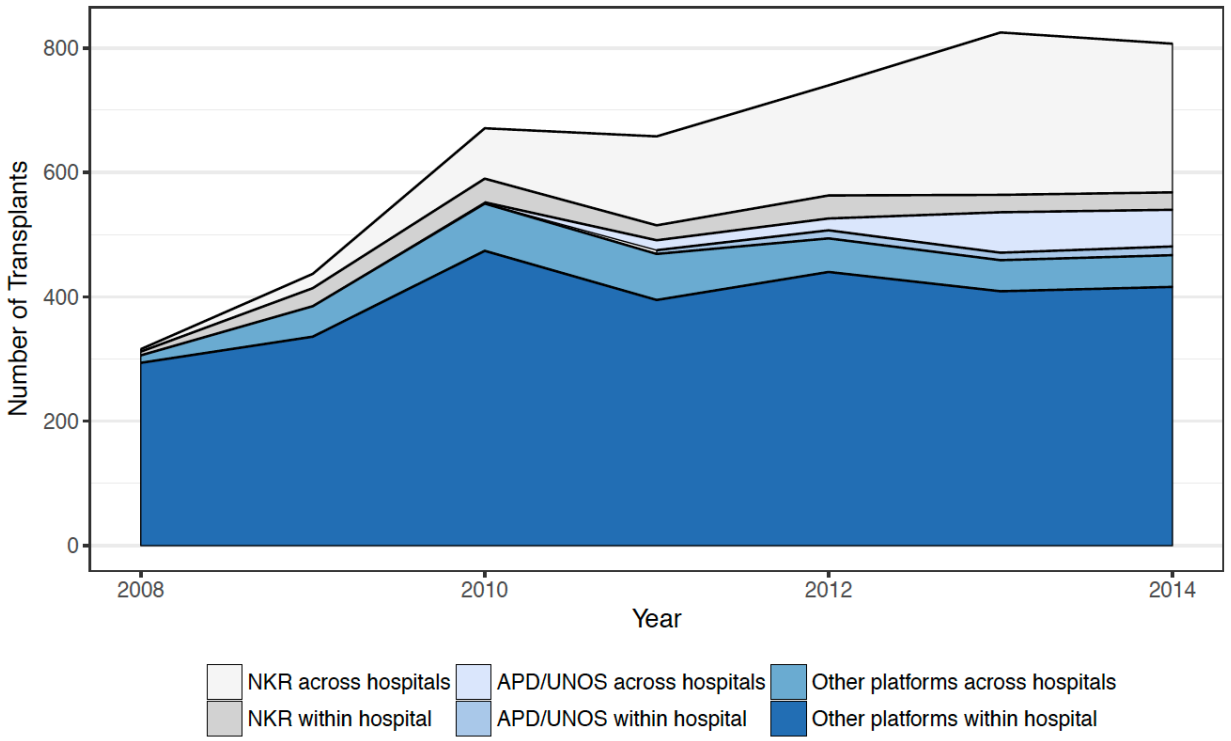
- Transplantation is the treatment of choice
  - Improves quality of life and extends life
  - Saves over $300,000 per transplant
- Kidney waitlist has grown to ~100,000 patients
- Living donor kidney exchange can address this shortage
  - Swaps organs amongst incompatible patient-donor pairs
  - Multiple platforms: National Kidney Registry, Alliance for Paired Donation, United Network for Organ Sharing



Challenges in Kidney Exchange

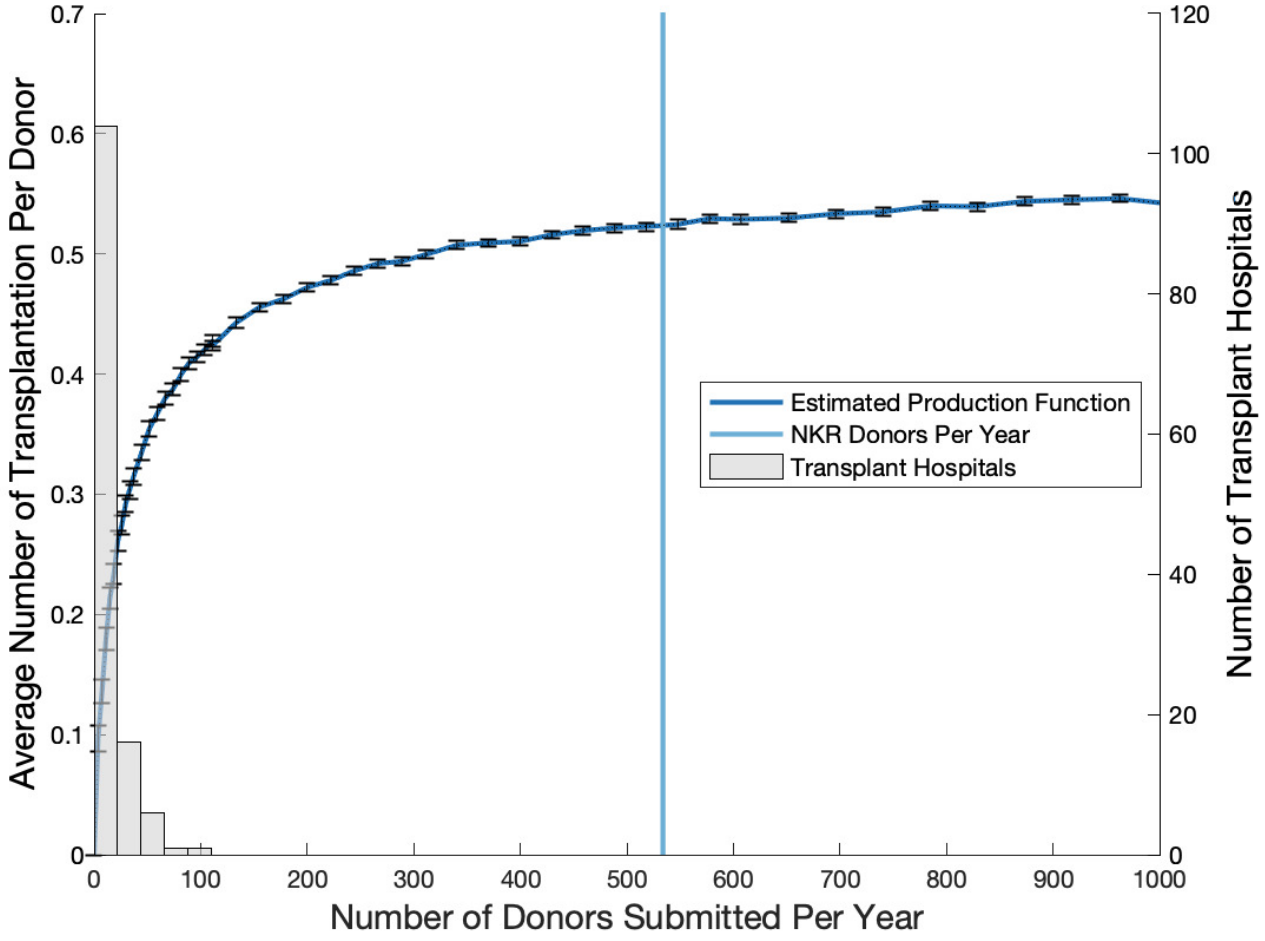
- Kidney exchange markets are **fragmented**, **selected**, and **inefficient**
- Within hospital exchanges are performed by over 100 different centers
- Fragmentation makes it hard to find matches

Fragmented Market Structure



NKR = National Kidney Registry APR = Alliance for Paired Donation
UNOS = United Network for Organ Sharing

Match Efficiency and Platform Size



- Improved coordination could result in 30 – 60% more transplants

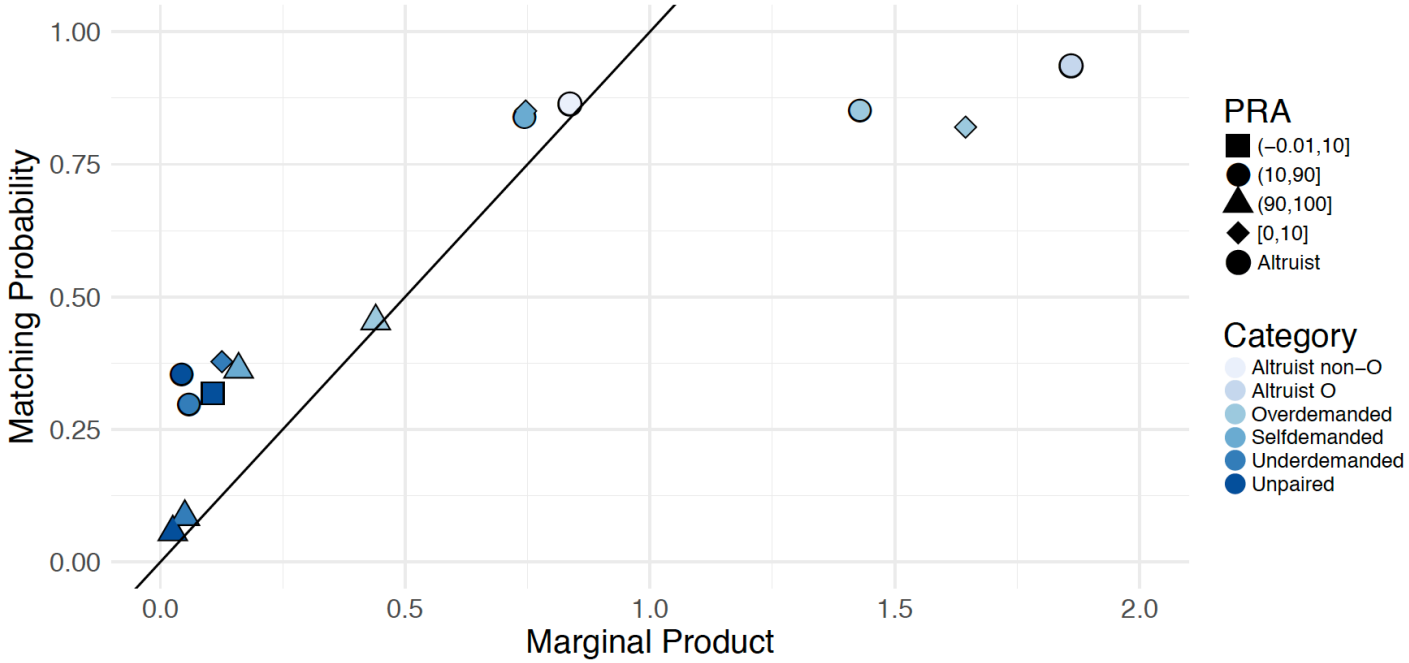
Findings

Economic theory: Two sources of market failure and their fixes

1. Inefficient platform design encourages matching within hospital
    - Mandates
    - Frequent-flyer type “point systems”

2. Agency problems due to participation costs
    - Address financing of matching costs. Not currently covered by Medicare

Current Incentives vs. Optimal Incentives



Impact

Policy outreach

- NKR adopted a design that resembles our recommendations
- APD is in the process of implementing a design suggested by us
- Provided an informational brief to DC policymakers
  - Congress, Medicare, and executive branch
- March 2021: hosted workshop with practitioners and researchers

Work to be done

- Global kidney exchange
- Deceased donor kidney waitlist
  - More patients waiting than before
  - Discard rate is still high
- Related design issues in heart transplantation

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What's next?

Launch Timeline & Future Projects

WORKFORCE

The Long-Term Effects of Universal Preschool in Boston

READ MORE ⟶

VIEW ALL RESEARCH

Future Projects

Education and the Workforce

- **Financing the future of higher education**
  - Experimental study in partnership with Common App and Scholarship America
  - What interventions streamline scholarship awards and improve college access for students?
  - Also: continuing project with STBF scholarship program

- **Expanding our understanding of universal pre-k's long-run impacts**
  - Longitudinal study of pre-k's effects on long-term outcomes (college graduation, labor participation, and crime)

Health care

- **Understanding the use of artificial intelligence in medical diagnoses**
  - Experimental study with Harvard, Stanford, and health care professionals
  - When and how can artificial intelligence be used for diagnosing medical images?

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Closing Remarks

Parag Pathak
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Faculty Director, MIT Blueprint Labs