

Experimental economics

Lecture 10: Field experiments

Matej Lorko

matej.lorko@euba.sk

Materials: www.lorko.sk/lectures

References:

- Weimann, J., & Brosig-Koch, J. (2019). *Methods in experimental economics*. Springer International Publishing. Chicago
- Jacquemet, N., & l'Haridon, O. (2018). *Experimental economics*. Cambridge University Press.

Michael Kremer story

- In 2019, UChicago economist Michael Kremer (then at Harvard) was awarded the Nobel Prize alongside Abhijit Banerjee and Esther Duflo of MIT for their groundbreaking work using field experiments to help reduce poverty. In the 1990s and 2000s, Kremer conducted several randomized controlled trials in Kenyan schools testing potential interventions to improve student performance.
- In the 1990s, Kremer worked alongside an NGO to figure out if buying students new textbooks made a difference in academic performance. Half the schools got new textbooks; the other half didn't. The results were unexpected—textbooks had no impact.
- In the early 2000s, Kremer returned to Kenya to study a school-based deworming program. He and a colleague found that providing deworming pills to all students reduced absenteeism by more than 25%. After the study, the program was scaled nationwide by the Kenyan government. From there it was picked up by multiple Indian states—and then by the Indian national government.

Field experiments

- A field experiment is a research method that uses some controlled elements of traditional lab experiments, but takes place in natural, real-world settings. This type of experiment can help scientists explore questions like: Why do people vote the way they do? Why do schools fail? Why are certain peoples hired less often or paid less money?
- Field experiments bridge the highly controlled lab environment and the messy real world. Social scientists have taken inspiration from traditional medical or physical science lab experiments. In a typical drug trial, for instance, participants are randomly assigned into two groups. The control group gets the placebo—a pill that has no effect. The treatment group will receive the new pill. The scientist can then compare the outcomes for each group.
- A field experiment works similarly, just in the setting of real life. The key to cleaning up the mess is randomization—or assigning participants randomly to either the control group or the treatment group. Though lab experiments are still common in the social sciences, field experiments are now often used by psychologists, sociologists and political scientists. They've also become an essential tool in the economist's toolbox.

Field experiments

- The approach of conducting field experiments in economics refers, quite simply, to the application of experimental methods in the ‘field’ — namely in the ‘real world’ or with actual market participants, rather than in the laboratory with student subjects.
- Field experiments in economics are relatively new, yet they have become one of the fastest growing and ‘fashionable’ methodologies in economics and the social sciences in recent years. There are several reasons for this. One is the increasing emphasis among policy-makers on ‘evidence-based policy’: field experiments offer the prospect of determining what ‘works’, and what does not work. More generally, field experiments are useful in assessing causality, which is a requirement if hypotheses are to be properly tested. Empirical verification requires that the decision-makers under study operate in a real world context, subject to actual stakes, incentives, constraints, and contexts. This is not true in laboratory-type experiments.
- Field experiments, if well designed, directly tackle the pervasive counterfactual problem — by which we mean establishing what would have happened in the absence of the intervention (or treatment) under investigation. By creating correct counterfactuals, unobservable influences can be balanced, allowing the researcher to overcome confounding issues that have plagued other empirical approaches attempting to go beyond correlations to establish causality. Thus an important advantage of field experiments is their ability to provide the researcher with causal relationships in naturally occurring settings.

Field experiments

- Field experiments can control the variable of interest, but cannot necessarily control the changing context of the environment. Field experiments have been used primarily in microeconomics research because the researcher is often in a position to control the variable of interest. This is less likely to be the case in macroeconomics. For example, it is difficult to conduct field experiments that examine the impact of changing tax rates, interest rates, or the money supply.
- Field experiments have been used to address some important public and economic policy challenges. There are a number of areas in economics that have attempted to use field experiments., including education, environmental conservation, taxation, charitable giving, personal finance, and labour supply.
- However, that there are a number of methodological and even philosophical issues relating to field experiments that have not been fully resolved. Moreover, as a policy tool, they have practical issues such as cost as well as ethical issues (such as arise in medicine). There has, indeed, been some criticism on the field experimental approach, especially when it comes to drawing inferences from experiments for theory and external validity. By external validity, we mean how the results from the field experiment generalize to other contexts and populations.

What is a field experiment?

- Field experiments lie on a spectrum between laboratory experiments, where all conditions and interventions are controlled (controlled data) and studies based on naturally occurring data. Essentially, field experiments involve a mixture of naturally occurring data and the experimental method.
- It is also useful to delineate what field experiments are not—since there are many prevalent misconceptions. First, field experiments are not behavioural economics. The former is a research method, the latter is a field or a body of research insights, some of which have been unearthed using field experimental methods. Second, field experiments are not pilot studies. A field experiment can be done on the national rollout of a policy, and, equally, pilots are not necessarily field experiments. Third, field experiments are not RCTs. Randomization is often used in various settings, such as the laboratory, and all field experiments do not necessarily have randomization (though many do).
- It is useful, however, to categorize field experiments into three types: (i) an artefactual field experiment (AFE); (ii) a framed field experiment (FFE); (iii) a natural field experiment (NFE).
- AFEs use non-standard subject pools directly related to the researcher's research question. They have primarily been used to compare student behaviour to more relevant populations, or to incorporate important population-specific characteristics into the research design. FFEs move a step closer to the naturally-occurring setting by introducing a natural context, though they may still suffer from selection bias and experimenter effects. Finally, NFEs overlay randomized incentives or contextual factors on subjects in their natural environment where they do not know that they are participating in an experiment.

What is a field experiment?

- Naturally occurring context:
 - Eliminates participation bias, but it does not address self-selection to program choices (e.g., opt-in v. opt-out) = examines only the people who actually participate in the context. Works with actual time scales, magnitudes, ...
- Participants unaware they are taking part in a research study
 - Avoids critique of observation bias (e.g., social desirability bias).
- Contrast with “lab in the field” (LITF) experiments:
 - LITF: has participation bias, participants aware of being observed, proxy outcomes
 - But LITF allows other measurements: surveys, repeated measures, immediate results

Advantages and disadvantages of field experiments

- Advantages
 - external validity
 - outcomes hard to measure otherwise (education outcomes, health outcomes...)
 - can use specific cohorts in society, can precisely measure time, and effect magnitudes
 - most direct policy relevance
- Disadvantages
 - limited external validity - What conclusions are actually externally valid? How is this actually different from a lab study?
 - hard to test theory, ensure robustness and replication, and design precise measure mechanisms

Case study: A Field Experiment with the American Red Cross: Example of Possible Contamination

- Lacetera, Macis, Slonim (Management Science, 2014)
- Research question: Can Rewards increase donations? Or do they “Crowd Out” Altruism-Intrinsic Motives?
- Extensive survey & lab studies (from the late 1960s to the present) tends to support “Crowding Out”
- Design: rewarding volunteers with \$5, \$10, and \$15 gift cards for blood donation

Case study: A Field Experiment with the American Red Cross: Example of Possible Contamination



Northern Cuyahoga and Western Lake County Blood Drive Schedule – December 2009

If you are interested in donating Double Red Cells, please call 1-800-GIVE-LIFE to find a site near you

<p>Cleveland Clinic Surgical Center 9500 Euclid Ave, Cleveland Every Wednesday 10:00 AM to 3:30 PM</p>	<p>The Lakefront Community Center 1 Bliss Lane, Euclid December 3 & 17 New Hours - 1:00 PM to 6:00 PM</p> <p>December 31 Special Holiday Hours 9:00 AM – 2:00 PM</p>	<p>Center for Pastoral Leadership 28700 Euclid Avenue, Wickliffe Saturday, December 5 9:00 AM – 2:00 PM All that come to the blood drive will receive a continental breakfast or lunch and a special treat bag courtesy of the Center for Pastoral Leadership.</p>
<p>East Shore United Methodist Church 23002 Lake Shore Blvd, Cleveland Sunday, December 6 9:00 AM – 1:00 PM Light Refreshments will be served!</p>	<p>Wickliffe Community Center 900 Warden Road, Wickliffe Wednesday, December 9 12:30 PM – 5:30 PM</p>	<p>Willowick Community Center 321 East 314th Street, Willowick Friday, December 11 1:00 PM – 7:00 PM</p>
<p>Radisson Hotel 35000 Curtis Blvd, Eastlake Friday, December 18 11:00 AM – 3:00 PM</p>	<p>Severance Hall 11001 Euclid Ave., Cleveland Monday, December 28 12:00 PM – 7:00 PM Join us for a variety of gifts and raffle prizes!</p> <p><i>Pound for a Pint – Come to donate blood and receive a pound of coffee and a coupon for a free donut from Dunkin' Donuts.</i></p>	<p><i>You can make the difference by adding one more gift to your holiday list this year. Please schedule your blood or platelet donation this month and give the gift of life!</i></p>

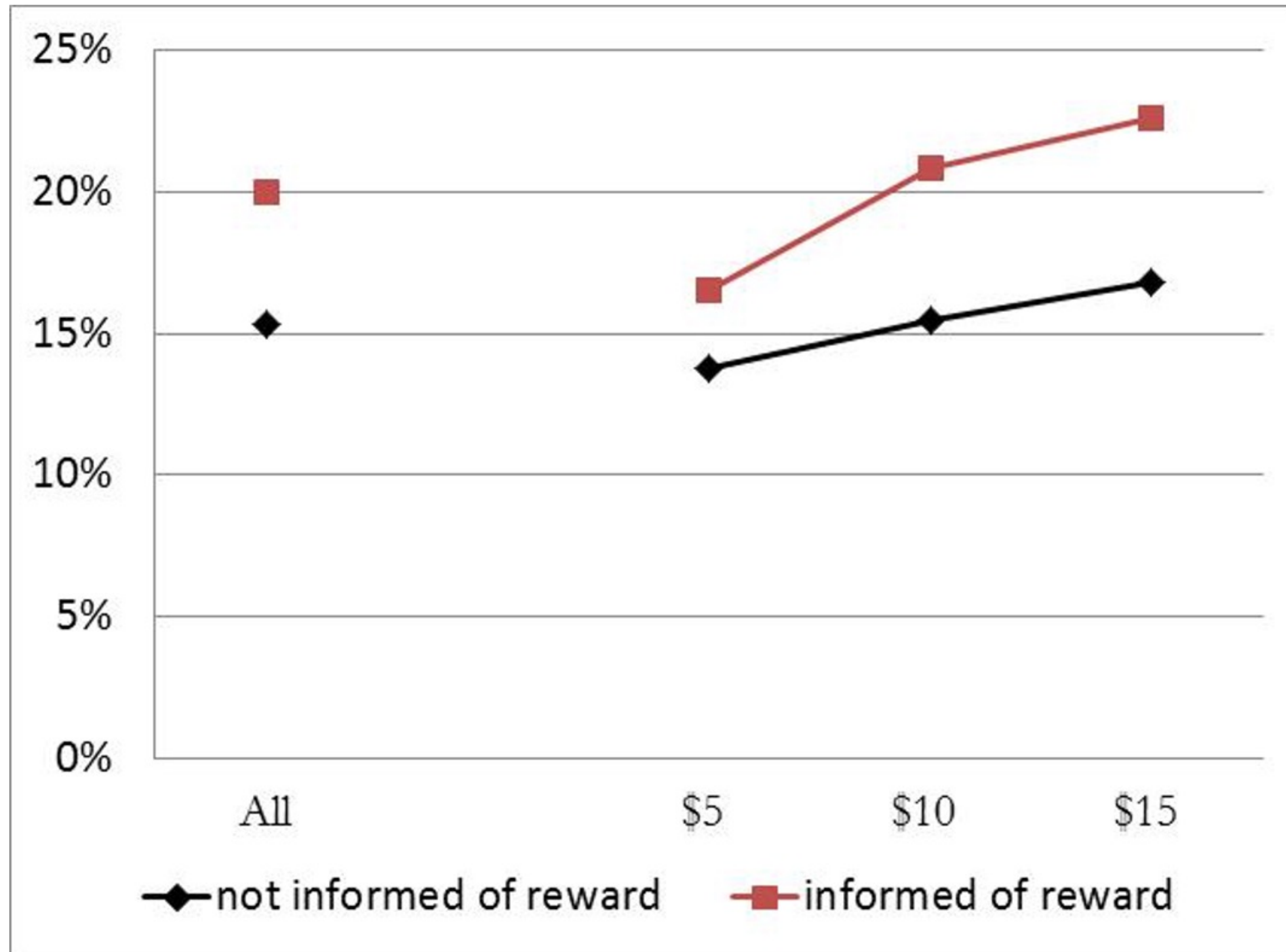


Northern Cuyahoga and Western Lake County Blood Drive Schedule – December 2009

If you are interested in donating Double Red Cells, please call 1-800-GIVE-LIFE to find a site near you

<p>Cleveland Clinic Surgical Center 9500 Euclid Ave, Cleveland Every Wednesday 10:00 AM to 3:30 PM</p>	<p>The Lakefront Community Center 1 Bliss Lane, Euclid December 3, 10, & 17 New Hours - 1:00 PM to 6:00 PM</p> <p>December 31 Special Holiday Hours 9:00 AM – 2:00 PM</p>	<p>Center for Pastoral Leadership 28700 Euclid Avenue, Wickliffe Saturday, December 5 9:00 AM – 2:00 PM All that come to the blood drive will receive a continental breakfast or lunch and a special treat bag courtesy of the Center for Pastoral Leadership.</p>
<p>East Shore United Methodist Church 23002 Lake Shore Blvd, Cleveland Sunday, December 6 9:00 AM – 1:00 PM Light Refreshments will be served!</p>	<p>Wickliffe Community Center 900 Warden Road, Wickliffe Wednesday, December 9 12:30 PM – 5:30 PM</p>	<p>Willowick Community Center 321 East 314th Street, Willowick Friday, December 11 1:00 PM – 7:00 PM</p>
<p>Radisson Hotel 35000 Curtis Blvd, Eastlake Friday, December 18 11:00 AM – 3:00 PM Come to donate and choose \$15 worth of gift cards for Target, Giant Eagle, or BP Gas Stations.</p>	<p>Severance Hall 11001 Euclid Ave., Cleveland Monday, December 28 12:00 PM – 7:00 PM Join us for a variety of gifts and raffle prizes!</p> <p><i>Pound for a Pint – Come to donate blood and receive a pound of coffee and a coupon for a free donut from Dunkin' Donuts.</i></p>	<p><i>You can make the difference by adding one more gift to your holiday list this year. Please schedule your blood or platelet donation this month and give the gift of life!</i></p>

Case study: A Field Experiment with the American Red Cross: Example of Possible Contamination



- Robustness: Lacetera, Macis and Slonim (Science, 2013)
- Over 19 rewards. 5 research teams, 4 countries
- Results
 - 18 rewards had positive, significant effect on donations; 1 had no effect
 - deferrals did not change significantly, though directionally decreased with rewards.

Case study: Reducing Costs

Craig, Garbarino, Heger, Slonim 2020 Management Science, Australian Red Cross Blood Service Data

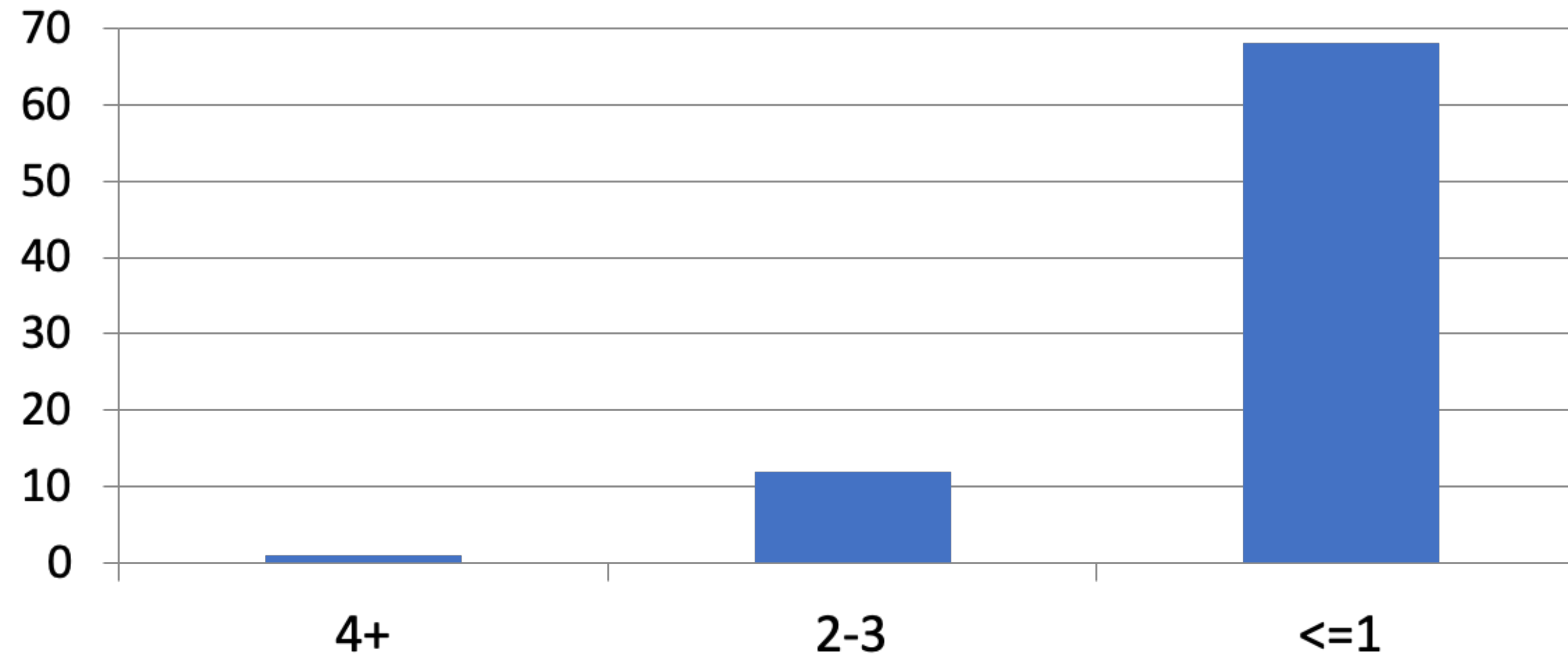
- Surveys find people are less satisfied and less likely to return after longer wait times (in many contexts)
- But quite surprising, at the time of this study, not a single study had looked at whether wait times actually affect return behaviour
- Survey of blood donors (where they measured the wait time of 1,500 donors at 4 donations centres) indicates, consistent with literature, that the longer they wait:
 - the less satisfaction they had with the experience
 - the less intention they state that they will donate again
- 1. But does waiting longer affect actual donor re-patronage?
- 2. And if so, why? Dis-satisfaction or higher expected future (time) costs?

Case study: Reducing Costs

Craig, Garbarino, Heger, Slonim 2020 Management Science, Australian Red Cross Blood Service Data

Whole Blood Donations

Number of Days Delayed Return for a One SD (~20 Mins) Increase in Wait Time



Number of Donations in Past Year

- Implies about 78,000 fewer donations per year (about 7% of annual donations for a 1 SD increase in wait times)
- The Effect was NOT caused by attitudes (e.g., the “hot” emotional state)
- The effect was entirely driven by the actual wait time (e.g., the “cold” state evaluation/expectations)
- Australian Red Cross mean wait time has fallen from ~42 to ~28 mins since data collection

Case study

- Addressing coordination failures in altruistic markets
 - A field registry study
 - Garbarino, Heger, Slonim, Wong (2020 MS)
 - A laboratory intertemporal coordination study
 - Lorko, Servátka, Slonim and Ďuríník (2023)

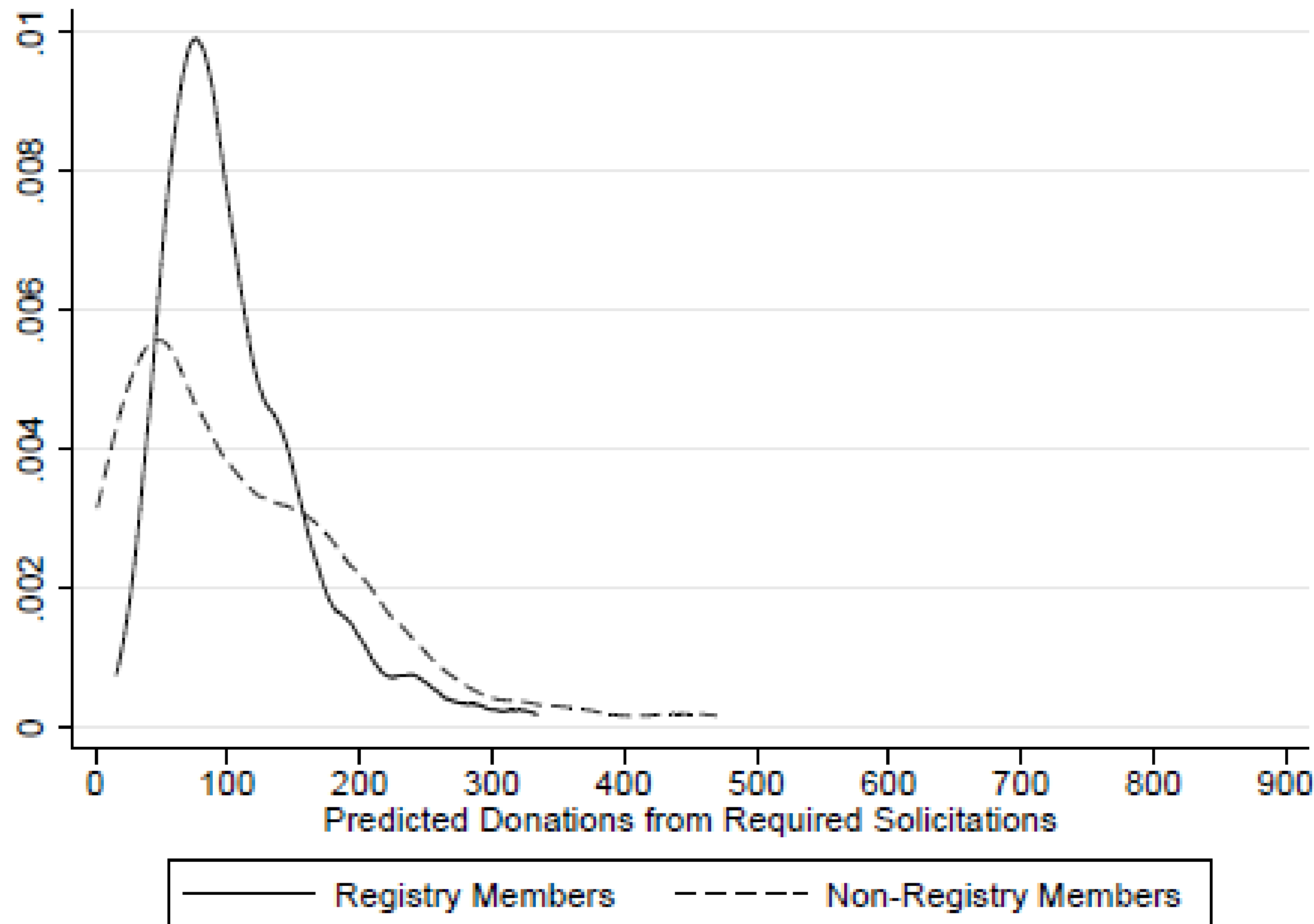
Building A National Registry: Garbarino, Heger, Slonim, Wong (2020 MS)

- Worked with the Australian Red Cross Lifeblood to address predictable shortages (primarily winter shortages)
- Two-stage process:
 - 1. Called and invited to join Blood Service Emergency Donor Group
 - Called only LONG-LAPSED donors (no donations for at least two years)
 - Promised only to call when a shortage for their blood type and never more than twice per year
 - Reached approximately 15,000 long-lapsed donors
 - **~82% joined** (similar across main experimental conditions)
 - 2. Later, when there was a shortage, received invitation to make an appt to donate
 - This occurred almost exclusively during winter months
 - **Key Result: Significantly more likely to donate in registry conditions (13.0% vs. 6.0%)**

Building A National Registry: Garbarino, Heger, Slonim, Wong (2020 MS)

- Thought Experiment
- 1. Using the mean probabilities to donate given a solicitation, consider a case where the Blood Service needs to collect 100 donations during a critical shortage period.
- 2. We calculate the required solicitations to obtain an expectation of 100 donations from registry (769) and non-registry members (1,667).
- 3. The figure on the next slide shows the distribution of expected donations if the required solicitations are made to the non-registry and registry groups. By construction, the mean of each distribution is 100.

Building A National Registry: Garbarino, Heger, Slonim, Wong (2020 MS)



- In sum: Blood Service would need to:
- 1. call more than twice as many non- than registry members
- 2. And would be more likely to cause under or over supply

Intertemporal coordination in volunteer markets (Lorko, Servátka, Slonim, Ďuríník)

- Idea: Too few donors showing up at a blood bank is a problem. But so is too many.
- Inefficiencies in volunteer markets
 - (1) aggregate supply and demand do not match
 - (2) the transacting volunteers and recipients do not have the highest net marginal utility (i.e., marginal benefits minus marginal costs).
 - (3) intertemporal spillovers - especially if oversupply, causes undersupply in subsequent period
- Research questions
 - How does introduction of post-donation waiting periods affects the coordination on altruistic market and its effectiveness ? (**when** becomes more important than **who**)
 - Can the efficiency be increased by
 - providing information on current demand?
 - providing information on past supply?

Intertemporal coordination in volunteer markets (Lorko, Servátka, Slonim, Ďuríník)

- Treatments
 - Two Wait conditions
 - W0: Agents eligible to help every period
 - W2: two periods of ineligibility after each period an Agent helps
 - Three information conditions
 - Limited Information LI = Basic Market Setup
 - Demand Information DI = Basic Market Setup + realized demand info
 - Supply Information SI = Basic Market Setup + past supply info

Theoretical results (based on Monte Carlo simulations)

	Undersupply	Oversupply	Charity Revenue	Agent costs	Market surplus
W2 in all conditions	Higher	Lower	Lower	Lower	Lower
Demand info in W0	Same	Lower	Same	Lower	Higher
Supply info in W0	Same	Lower	Same	Lower	Higher
Demand info in W2	Same	Lower	Same	Lower	Higher
Supply info in W2	Lower	Lower	Higher	Lower	Higher
Dem vs. Sup. in W0	Same	Supply	Same	Supply	Supply
Dem. vs. Supp in W2	Supply	Supply	Supply	Supply	Supply

Theoretical results vs. Laboratory results

	Undersupply	Oversupply	Charity Revenue	Agent costs	Market surplus
W2 in all conditions	Higher Higher	Lower Lower	Lower Lower	Lower Lower	Lower Lower
Demand info in W0	Same Same	Lower Same	Same Same	Lower Same	Higher Higher
Supply info in W0	Same Same	Lower Same	Same Same	Lower Same	Higher Same
Demand info in W2	Same Same	Lower Lower	Same Same	Lower Same	Higher Same
Supply info in W2	Lower Lower	Lower Lower	Higher Higher	Lower Same	Higher Higher
Dem vs. Sup. in W0	Same Same	Supply Supply	Same Same	Supply Same	Supply Demand
Dem. vs. Supp in W2	Supply Supply	Supply Same	Supply Supply	Supply Demand	Supply Supply

More case studies

- **Studying bias and discrimination:** A 2004 study published by UChicago economists Marianne Bertrand and Sendhil Mullainathan (then at MIT) examined racial discrimination in the labor market. They sent over 5,000 resumes to real job ads in Chicago and Boston. The resumes were exactly the same in all ways but one—the name at the top. Half the resumes bore white-sounding names like Emily Walsh or Greg Baker. The other half sported African American names like Lakisha Washington or Jamal Jones. The study found that applications with white-sounding names were 50% more likely to receive a callback.
- **Examining voting behavior:** Political scientist Harold Gosnell, PhD 1922, pioneered the use of field experiments to examine voting behavior while at UChicago in the 1920s and '30s. In his study “Getting out the vote,” Gosnell sorted 6,000 Chicagoans across 12 districts into groups. One group received voter registration info for the 1924 presidential election and the control group did not. Voter registration jumped substantially among those who received the informational notices. Not only did the study prove that get-out-the-vote mailings could have a substantial effect on voter turnout, but also that field experiments were an effective tool in political science.
- **Testing ways to reduce crime and shape public policy:** Researchers at UChicago’s Crime Lab use field experiments to gather data on crime as well as policies and programs meant to reduce it. For example, Crime Lab director and economist Jens Ludwig co-authored a 2015 study on the effectiveness of the school mentoring program Becoming a Man. Developed by the non-profit Youth Guidance, Becoming a Man focuses on guiding male students between 7th and 12th grade to help boost school engagement and reduce arrests. In two field experiments, the Crime Lab found that while students participated in the program, total arrests were reduced by 28–35%, violent-crime arrests went down by 45–50% and graduation rates increased by 12–19%.

Even more ideas

- The role of experimentation in education policy
- Using field experiments to address environmental externalities and resource scarcity: major lessons learned and new directions for future research
- What field experiments have and have not taught us about managing workers
- The use of field experiments to increase tax compliance
- Increasing charitable giving in the developed world
- Five steps to planning success: experimental evidence from US households
- Link: <https://academic.oup.com/oxrep/issue/30/4>