



## Economic Experiments for Policy Analysis and Program Design: A Guide for Agricultural Decisionmakers

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### What Is the Issue?

For many policy design questions—such as setting up enrollment structures, establishing program eligibility criteria, investing in education and outreach materials, and ranking/selecting applications—policymakers often seek evidence on how well alternative approaches will achieve program goals. Experiments offer a way to gather data for these uses. This report examines the use of economic experiments for building evidence to inform policy, providing an introduction to the field of experimental economics and discussing the increasing use of field experiments and randomized controlled trials (RCTs) in the social sciences and in government. We present several case studies illustrating recent uses of experimental methods to inform agricultural policies.

### What Did the Study Find?

This report provides a number of lessons gleaned from both the growing literature on experiments and from actual experiments to examine ways of improving agricultural programs.

- **Laboratory experiments**—often with students using networked computers—are useful for testing basic theory and initial evaluation of prospective policies where naturally occurring data do not exist. Lab experiments offer a degree of control, allowing researchers to change one factor at a time to determine causality.
- In contrast, **field experiments**—using people in a real-life environment—offer less control but have a “context” that more likely mirrors the program’s target environment with participants who better represent the population of interest.
- The most credible tests of the likely impact of a policy or policy instrument occur when two similar groups are compared—setting one as a “control” and the other as the “treatment” group. In particular, experiments based on **randomized controlled trials (RCTs)**—often large-scale field experiments where subjects are randomly assigned to control and treatment groups—can provide evidence that is gathered in a manner that isolates causality. There is a long history of RCTs being used to inform Federal policymaking, particularly in education, welfare, and health care.
- Lab experiments are relatively inexpensive and easy to perform. Field experiments—especially those evaluating key aspects of large programs—are more expensive and difficult to administer. A hybrid, cost-effective approach is to test new policy mechanisms iteratively, moving those that do well in laboratory experiments into a field setting, such as via a “pilot” program.
- Experimentation need not be limited to wholesale tests of new policies and programs. **Administrative experiments**, which systematically test new ways of operating an ongoing program, can provide low-cost and rapid information to improve program operations. A program’s administrative data can be used by the experimenter to readily measure the effect of a treatment without the burden and expense of additional surveys or focus groups. For example, in the “Encouraging Participation in the Conservation Reserve Program”

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experiment discussed below, researchers used administrative data to identify which new enrollees were part of the experimental treatment.

- Opportunities for experimentation, including the use of administrative experiments, occur frequently within the normal policy process and include: (1) when a new program is rolled out or during a new iteration of a program (such as a yearly program signup); (2) when a program is oversubscribed and decisionmakers must choose which applicants to enroll; (3) when a program’s target populations or goals change; and (4) when a program is undersubscribed and interventions (such as new methods of outreach) may increase participation.

To illustrate the use of a variety of experimental approaches and to highlight key experimental design features, this report reviews the methods and findings of five case studies where experiments were used to investigate issues pertinent to agricultural policy design.

- **“Asymmetric Auctions and the Design of Enrollment Mechanisms.”** This *laboratory experiment* investigated whether it is possible to design a more cost-effective means of enrolling participants in voluntary conservation programs. Researchers presented students with a competitive enrollment mechanism—a *reverse auction*—wherein a purchaser (such as a conservation program manager) accepts a number of offers from a variety of potential program participants; the purchaser has limited information about these potential participants. The costs of operating the hypothetical program were reduced by as much as 14 percent when information about each potential participant is built into the enrollment mechanism.
- **“Do Bonuses Increase the Agglomeration of Buffers Along Streams?”** This *laboratory experiment* investigated how to coordinate enrollment in a voluntary program when overall benefits depend on the geographic distribution of participants. Using both student and farmer participants, researchers investigated whether paying participants “spatial bonuses” (for enrolling near neighbors), using “spatial targeting” (prioritizing adjacent fields for enrollment), or both can improve environmental outcomes. Spatial targeting was found to increase total environmental benefits and social welfare, but spatial bonuses did not.
- **“Personal Discount Rates.”** This *field experiment*, conducted with farmers, investigated the tradeoff between upfront and future payments. Participation in conservation programs may be affected by this timing; farmers who strongly prefer upfront payments might pass on a program offering an income stream spread over time. Researchers presented farmers with an option of receiving a payment of several hundred dollars now or a higher payment 9 months in the future. Farmers in this study, on average, needed to be paid an interest rate of more than 28 percent before forgoing the upfront payment for the delayed payment.
- **“Encouraging Participation in the CRP”** and **“Encouraging Voter Participation in FSA County Committee Elections.”** These two *administrative experiments* were structured as randomized controlled trials to study the effectiveness of farmer outreach initiatives used by the USDA’s Farm Service Agency. Researchers found that simple outreach—customized program re-enrollment letters in the first, and customized voter reminder postcards and ballots in the second—increased farmland owner interest in participating in a conservation program and increased voter participation in county committee elections. The reminder letters generated one additional offer to re-enroll in a conservation program for a printing/mailing cost of \$41; likewise, the printed outreach resulted in an additional vote for every \$28.55 spent.

## How Was the Study Conducted?

This report consists of three parts. First, we review fundamental research in the methodology of experimental economics and experiments in social science more generally. We use this review to establish a small set of “common practices” that researchers use when conducting economic experiments. We next examine successful instances when public policy was informed by experimental studies and analyze the characteristics of these influential studies. Finally, we synthesize several economic experiments conducted by ERS and collaborators. Some were conducted in the laboratory, some in the field, and some in partnership with USDA program agencies. These case studies illustrate how experiments can address real policy questions and provide useful insights.