

## Experimental practices in economics: performativity and the creation of phenomena

Kübler, Dorothea

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Dorothea Kübler \*

**Experimental Practices in Economics:  
Performativity and the Creation of Phenomena**

\* WZB, TU Berlin, and IZA

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Wissenschaftszentrum Berlin für Sozialforschung gGmbH,  
Reichpietschufer 50, 10785 Berlin, Germany, Tel. (030) 2 54 91 – 0  
Internet: [www.wzb.eu](http://www.wzb.eu)

## ABSTRACT

### **Experimental Practices in Economics: Performativity and the Creation of Phenomena \***

by Dorothea Kübler

This contribution provides a brief overview and discussion of the role of experiments in economics. It is argued that economic experiments have convinced economists and the public of the existence of phenomena that have been outside the scope of economics. The success of these experiments is partly due to the performative nature of experiments. To develop this argument, examples of experiments are provided, and two different sets of criticisms of experiments are discussed. The paper concludes with a discussion of which questions economists should address and how experiments can be used to study policy-relevant questions.

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\* Prepared for the conference "Spuren der Avantgarde: Theatrum Oeconomicum" at the Free University Berlin in June 2009.

## ZUSAMMENFASSUNG

### **Experimentelle Praktiken in der Ökonomie: Performativität und die Erzeugung neuer Phänomene**

Der Beitrag beschäftigt sich mit der Rolle von Experimenten in der Ökonomie. Es wird argumentiert, dass Experimente dazu in der Lage sind, sowohl Ökonomen als auch eine breitere Öffentlichkeit davon zu überzeugen, dass bestimmte Phänomene existieren, die vorher nicht als relevant für die Ökonomie angesehen oder gar nicht wahrgenommen wurden. Diese Wirkung von Experimenten beruht zu einem wichtigen Teil auf ihrer Performativität. Um dieses Argument zu entwickeln, werden Beispiele für Experimente gegeben, verschiedene Kritikpunkte an Experimenten diskutiert sowie die Frage aufgeworfen, was die Grenzen der Ökonomie sind und wie Experimente zur Beantwortung wirtschaftspolitischer Fragen eingesetzt werden können.

# **Experimental Practices in Economics: Performativity and the Creation of Phenomena\***

Dorothea Kübler, WZB und TU Berlin

December 31, 2009

This contribution discusses the role of experimental economics within the economic discipline. It will emphasize the ability of economic experiments to convince both economists and a broader public of the existence of phenomena that have been outside the scope of economics. The success of these experiments is at least in part due to the performative nature of experiments. To develop this argument, I will first provide two examples of experiments as well as some general remarks regarding the reasons for the success of experimental economics (in sections 1 and 2). Then, I will discuss experiments or randomized controlled trials as a methodology and formulate two sets of criticisms (section 3 and 4). One set of criticisms concerns the value of randomized controlled trials in economics compared to other research methods. The other criticism relates to the question of whether economic experiments study aspects of human behavior that economists should concern themselves with. This raises the point of what the scope of economics is and what its boundaries are (section 5). Which questions should economists try to answer and which should they not care about? As a result, it could be asked if many economists have worked on the wrong issues in recent years and whether this provides an explanation of their inability to deal with the financial crisis.

## **1. What are economic experiments?**

In economic experiments, the participants (often students) play games or make decisions. The choices are recorded as data which are studied by the researcher. The experiment is designed in order to investigate the research question at hand. One of the main advantages of

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experiments is that it is relatively easy to control for various possible sources of an observed effect: The environment is known and replicable in all its facets, and controlled treatment variations allow tests of specific hypotheses.

Experiments can take place in a laboratory, i.e., a computer pool where subjects enter their decisions on a computer screen. There they can receive information or feedback about the other participants' behavior via the screen. However, the first economic experiments did not use computers but were conducted in classrooms, and the participants entered their decisions on sheets of paper. This is still a valuable method, for example when participants do not have to get feedback between their decisions. In contrast to laboratory studies, field experiments are conducted in a more natural context. The experimenter carefully changes certain variables of the real environment in which the decisions are made and records behavior under the various treatment conditions. It can be argued that field experiments bridge the gap between laboratory experiments and behavior in the real world.

### **1.1. Experiments and revealed preferences**

Economics deals with choices that people make, how the choices of decision makers interact, etc. Revealed preference theory, developed by Samuelson (1938), shows how to construct utility functions from observable choices. Consistent with this choice-based approach, experiments investigate real choices (in contrast to surveys with attitudinal questions or the measurement of physiological reactions, etc.). Participants are paid according to their choices so that successful participants earn more money in an experiment than unsuccessful ones. Direct monetary incentives help to control the motives of the participants.

The first economic experiments (by the Bernoulli brothers in 1738, and much later by Chamberlin and by Allais in the 1950s) focused on choices. However, the Bernoullis or Allais relied on hypothetical choices in that the people they asked for their decisions were not paid depending on their decisions. Today, many of these early experiments have been replicated with choices that affect the payments of the participants.

I will come back to the question of whether this focus on choices as the primitives of the theory is sufficient. But first I will discuss two examples of experiments: one lab experiment and one field experiment.

## 1.2 A laboratory experiment on beliefs about other players

The first experiment is an experimental study by Beard and Beil (1994) entitled: “Do people rely on the self-interest of others? An experimental study.” The experiment is based on a number of two-person games that can be represented with a game tree (see Figure 1). There are two players, A and B. A moves first and decides to choose action L or R. If she chooses L, she receives a payoff of \$9.75 and player B receives \$3. If player A chooses action R, player B gets to choose between action L and action R. If player B chooses L, player A gets a payoff of \$3 and player B gets \$4.75. If player B chooses R, player A gets \$10 and player B gets \$5. Now consider the decision problem of both players. Player A has to think about how player B will choose should she, player A, choose R. Player B, if he is a rational self-interested money maximizer, will choose R as this gives him \$5 instead of \$4.75 for choice L. If A anticipates B's choice, A should choose R to secure her a \$10 payoff instead of \$9.75 for choice L.

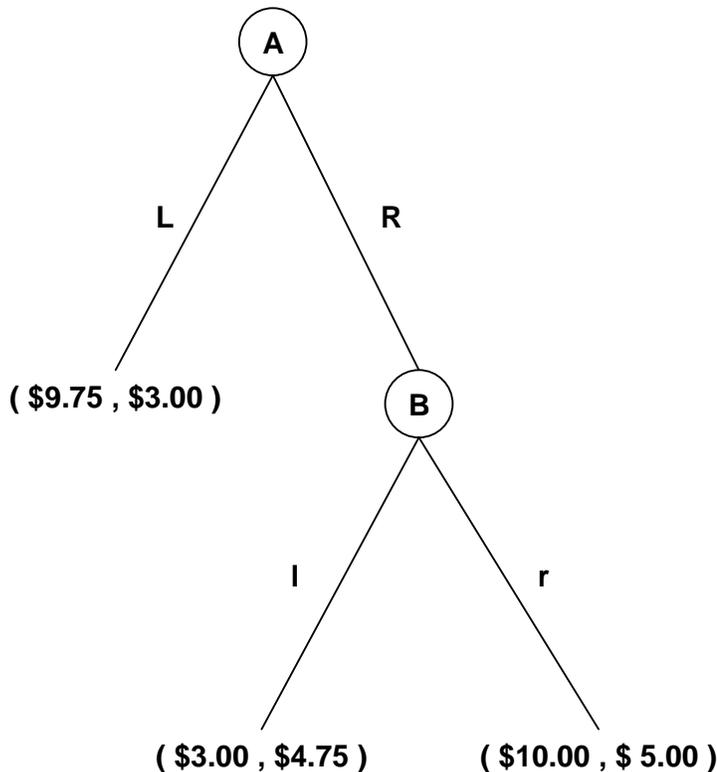


Figure 1: Game tree used by Beard and Beil (1994)

In contrast to this prediction, participants in the role of player A often choose L. But the results also show that participants in the role of player B almost always choose R. Thus, in the

experiment it would be optimal for a risk-neutral player A to choose R. The experiment provides evidence that people are often unwilling to rely on the self-interested behavior of others, although the other players almost always choose the maximizing option. The experiment demonstrates the need to differentiate between the assumption that agents engage in maximizing behavior and the assumption that agents are willing to rely on the maximizing behavior of others. As rational expectations about other players are a central concept of many solution concepts in economics, the study by Beard and Beil has led to a large literature about how players believe other players behave.

### **2.3 A field experiment on labor market discrimination**

The second experiment that I am going to use as an example for the role of experiments in economics is: “Are Emily and Greg more employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination”, by Marianne Bertrand and Sendhil Mullainathan (2004).

The design is very straightforward. Applications were sent to prospective employers who had posted newspaper ads for sales, administrative, and clerical jobs in Boston and Chicago. These applications were randomly assigned either a black-sounding name (such as Lakisha Washington or Jamal Jones) or a white-sounding name (such as Emily Walsh or Brendan Baker). The experimenters designed high- and low-quality resumés (differentiated by summer employment experience, extra computer skills, special honors, etc.). Two high- and two low-quality resumés were sent to each job opening, and the employers’ response to the applications was recorded. In particular, the outcome variable of interest is whether the applicant is invited by callback to an interview.

Applicants with white names received 50% more callbacks than applicants with black names. Moreover, high-quality applications with white names received 30% more callbacks than low-quality ones. For applications with black names, the ones with a higher quality did not receive significantly more callbacks. Thus, a higher quality of education only pays off for applicants with white-sounding names but not for those with black-sounding names.

Experiments like the one by Bertrand and Mullainathan receive a lot of attention from non-experimentalists in economics and also from the press. But also a number of theory-based lab experiments, like the one by Beard and Beil, have a strong impact on the thinking of

economists. Why is that the case? Possible reasons are that the questions addressed by the experiments are important, the experiments are simple, and the results are clear-cut. An additional, and in my view underestimated, reason is the performative nature of the setup. This brings me to

**Claim 1:** The success of experimental economics can in part be explained by the performativity of experiments and their spectacular nature.

The experimenter who designs an experiment is like the director of a play who sets the stage. The participants are the actors who follow the script but make their own choices within the setup of the experiment. There can be theatrical moments in experiments, especially when people interact in unexpected ways and thereby offer insights into human nature. Thus, just as in theater, experiments can be understood as “critical vision machines”, a term coined by Maike Bleeker (2009, p. 259). She writes:

“Theater here is not a matter of spectacle, exaggeration, or make-believe, but a matter of becoming aware of how we are implicated within what we see and how we see it, and how this in its turn is implicated in the performance of others addressing us.”

This theatrical situation is described to the reader of an experimental paper or the audience of a talk. The experimental setup thereby becomes vivid enough for the listener to put himself in the shoes of and empathize with the participant in the experiment. It is this performativity of experiments that has contributed to the success of experimental economics in convincing neoclassical economists and a general audience of the reality of certain behaviors that were previously regarded as unimportant, non-existent or simply too rare.

## **2. What is the role of experiments in economics?**

While experiments have a long tradition in the natural sciences, their use in the social sciences is more recent. Experiments still play only a minor role in sociology and political science, but they were used early on by social and cognitive psychologists. Economists learned from psychologists how to do experimental work on decision theory and social interaction. Although the number of economic experiments published in top journals is growing constantly, the role and importance of economic experiments are still controversial.

In the following, a list of the possible functions of experiments is provided:

I. **Test of the theory**

Experiments are used to compare observed behavior with theoretical predictions.

II. **Creation of phenomena** (Ian Hacking, 1983 and 1999)

“Experiments bring into being phenomena that do not naturally exist in a pure state” (Hacking, 1999, p.135).

III. **Search for meaning**

Experiments are useful for investigating potentially generalizable mechanisms (e.g., bounded rationality, discriminatory preferences).

IV. **Experiments are “material models”** (Klaus Schmidt, 2009).

Experiments are used to perform comparative statics by varying the exogenous variables over the treatments.

V. **“Whispering in the ears of princes”** (Alvin Roth, 1995)

Experiments can be used as wind tunnels for new policy measures.

The role of experiments as tests of the theory is the most straightforward and the one that is mentioned most often by experimenters themselves. Although it is true that the theory is the starting point for most economic experiments, experiments do not simply tell us whether a theory is correct or not. It is unclear when a theory should be discarded as it is only an approximation. It shows some internally consistent relationship between certain variables and can be more or less relevant to real behavior. In addition, rationality cannot be disproven as it follows from the decision to view people as agents who pursue their goals.

Nevertheless, theory is a very good starting point for an experiment as, given a set of assumptions, it yields a precise prediction of how participants should behave. Instead of rejecting or supporting a theory, interesting experiments provide some insights into *why* the theory makes the correct predictions or not. And by doing so, the experimenters demonstrate new phenomena. For example, the work by Beard and Beil introduced the notion of false expectations about others, which became a whole new topic of study. Their experiment has sparked new experiments and new theories on how people think about others. Before their experiment, theorists had paid relatively little attention to this phenomenon. This leads to

**Claim 2:** A major role of economic experiments is to create new phenomena that then become part of the economic discipline.

For example, due to experimental work, economics now deals with overconfidence, bidding fever, loss aversion, guilt, envy, social preferences, limited foresight, limited memory, etc. Thus, Hacking's characterization of the role of experiments is highly accurate for economics, but has not been highlighted yet. This also implies that economic experiments are more independent of theory than is usually assumed. Theory mainly provides a clear-cut way to think about experimental situations and results, but experiments are able to discover new phenomena that were absent from the theory before. Given a set of experimental findings, the observed phenomena are then integrated into the theory.

Experiments serve additional purposes that are complementary to the creation of new phenomena. They are useful to better understand the possible meaning of an action. For example, the results by Beard and Beil could be caused by the fact that people are, in general, unable to reason about someone else's motivation. This can either be tested with an appropriate experimental design, or experiments can be used to find out why, for example, employers discriminate between applicants with black- or white-sounding names.

In addition, experiments can be used like models in that they help to understand which outcomes result when parameters change (Schmidt, 2009). Such comparative static exercises are performed by running treatments with different exogenous parameters. Again, the goal is not a test of the theory but a more realistic and reliable prediction regarding the effects of parameter changes rather than the comparative static results provided by the theory.

Finally, experiments have started to play an important role for economic policy. Experiments can be used to compare different policy measures in order to "whisper in the ears of princes" (Roth, 1995). For example, laboratory experiments are used to test auction rules with respect to their allocative efficiency, simplicity for the participants, time needed to run the auction, etc. In the area of development economics, field experiments are conducted to evaluate policies.

### **3. Are randomized trials the "gold standard"?**

Are experimental methods (that is, randomized controlled trials) the gold standard for scientific methods? They are heavily propagated, not just in economics:

"Britain has given the world Shakespeare, Newtonian physics, the theory of evolution, parliamentary democracy – and the randomized trial." (British Medical Journal, 2001)

In economics, empirical investigations are traditionally based on data collected by statistics bureaus, the administration, etc. Randomized field or lab experiments provide a new source of data. Clearly, the main advantage is that by varying the treatment conditions, causal relationships can be established. However, experiments have a number of shortcomings. In the following, I will summarize some arguments put forward against the “gold standard” view of the experimental technique of randomized trials and discuss possible remedies.

1. Neglect of general equilibrium effects

Experiments and field experiments isolate one market, a bilateral exchange or an individual choice, and analyze the effect of a change in one variable on the outcome. The effect of this changed outcome on other transactions and other markets is typically neglected. While this is true for most micro-econometric analyses, lab experiments have the additional limitation that they do not provide a quantification of the effects. These shortcomings are especially problematic when an experiment is designed to show whether a policy works or not. The answer to this question can easily be reversed when general equilibrium effects on other markets are incorporated, or when the lack of quantification of the observed effects hides the fact that they are in reality negligible. Therefore, experiments are especially useful when they shed some light on *why* a policy has a certain effect. This explanation can then be tested further in a richer framework to evaluate its robustness and quantitative significance.

2. Contextual dependence and external validity

Experiments are conducted in the field or in the lab, but the results are typically interpreted as extending to contexts other than the actual field environment or the lab situation. However, the possible lack of external validity of lab experiments is a long-standing criticism and it remains an open question as to under which conditions one can expect behavior in the lab to be similar to behavior in a real situation. Thus, the high internal validity due to the control of the experimenter over all variables of the situation comes along with an artificial lab context and a possibly limited external validity of observed behavior. Field experiments have been propagated as a solution to this problem (see Glenn Harrison and John List, 2004). When an experiment is conducted in a natural context, participants are often not even aware that they are taking part in an experiment. However, experiments conducted in the field can still suffer from contextual dependence. For example, in development experiments one can worry about the impact of differences in the cultural context on the effectiveness of a

certain policy (e.g., a certain program works in Norway but not in Kenya, or the other way round).

### 3. Randomization and compliance

Randomized participation in the different treatment groups is necessary in order to identify the treatment effect. In field experiments it can be difficult to avoid self-selection of individuals into the treatment groups. If compliance with the experimental setup cannot be guaranteed, the results become invalid. Compliance is much easier to guarantee in lab experiments where the experimenter has more control over the subjects than in the field. Furthermore, even if the randomized assignment is successful, it does not necessary control for known and unknown potential confounders (John Worrall, 2007). Or as Nancy Cartwright (1989) admits, an experiment needs to be “ideal” in the sense that

“...all other causes that bear on the effect in question must have the same probability distribution in both groups” and “the assignment of individuals to either the treatment or the control group should be statistically independent of all other causally relevant features that an individual has or will come to have.” (p.64)

As Worrall (2007) points out, creating groups that are balanced with respect to known factors is an improvement over pure randomization even though there can still be an imbalance with respect to unknown factors. For causal inference, the researcher still needs to formulate assumptions on the independence between the explanatory variable of interest and the unknown factors.

### 4. Neglect of theory and explanation and the problem of heterogeneity

Sometimes experiments are merely set up to test whether a certain program works or not. They do not attempt to provide an explanation of why a certain behavior is observed, and often there is no theory on the background against which the data can be tested. Such experiments (mainly run in the field) are not very useful because they do not further the understanding of human behavior, nor do they contribute to an evaluation or the development of a theory. But an experiment as a pure test of the theory can only be the first step. Without gaining some understanding of why the theory works (for the right reasons or for reasons outside of the theory?) or why it fails to predict behavior correctly, the evidence is only of limited value for the study of human behavior.

This becomes evident when considering a heterogeneous population. The more heterogeneous the group, the less relevant are the average effects measured in experiments. As Deaton (2007) puts it:

“The mean treatment effect from an RCT may be of limited value for a physician or a policymaker contemplating specific patients or policies. A new drug might do better than a placebo in an RCT, yet a physician might be entirely correct in not prescribing it for a patient whose characteristics, according to the physician’s theory of the disease, might lead her to suppose that the drug would be harmful. Similarly, if we find that dams in India do not reduce poverty on average [...], there is no implication about any specific dam, even one of the dams included in the study, yet it is always a specific dam that a policy maker has to decide about.”

Thus, the better the causes and mechanisms of certain effects are known, the better one can deal with the heterogeneity of the population.

#### **4. Beyond revealed preferences**

Experiments have moved beyond revealed preferences by measuring not only the choices but also the expectations of participants, their brain activity, eye movements and other physiological processes. The reason is that doubts have arisen about the sufficiency of the revealed-preference approach to understanding behavior. Experimental and behavioral economics argues that

- a) people often make choices that do not maximize their well-being, and
- b) psychological and physiological evidence is relevant for economic theories.

For example, in the Beard and Beil experiment, people do not always take the payoff-maximizing choice. The question why this happens can be addressed by asking for the beliefs about the other player’s choice or by making use of brain-imaging techniques in order to understand how players think about other players.

A simple and straightforward extension of the choice-theoretic framework is the following: In the experiment by Beard and Beil, player A is asked what she expects player B to choose. A similar framework has been used by Fehr, Kübler and Danz (2008) in order to test whether player A chooses the optimal action, given her expectations. Also, it can be measured whether players have rational expectations in the sense that A’s expectation of B’s choice is correct.

In a similar vein, neuro-economic experiments can serve to understand whether and how players think about other players. In such experiments, brain-imaging techniques are used to investigate brain activity in decision tasks. For example, consider a similar setup to the experiment by Beard and Beil. The brain activity of a player is measured while she makes her decision and possibly thinks about another player and his choice. In particular, the experiment could employ a second treatment as a control where player A makes a choice without a second player involved. Comparing the activity of the brain in both treatments helps to understand why player A often chooses L. One possible explanation is that players who choose L in the experiment by Beard and Beil do not “mentalize”, i.e. do not think about player B’s decision. As the act of “mentalizing” is associated with the activity of certain areas in the brain, the lack of mentalizing could be identified if the brain scan is not sufficiently different in the two treatment conditions.

Criticism against this enlargement of the field of economics to the psychological and neurological aspects of choices has been put forward by Gul and Pesendorfer, 2005. They claim that

- a) “...economics has no therapeutic ambition, i.e., it does not try to evaluate or improve the individual’s objectives...”
- b) “...neuroscience evidence cannot refute economic models because the latter make no assumptions or draw no conclusions about the physiology of the brain.”

Both statements draw a line between what the authors define as belonging to the field of economics and what they believe is not part of it. In the next section, I will therefore discuss this question in more detail.

## **5. What is economics?**

Experimental economics has sparked a debate about which questions economists should address and which explanations of observed behavior are admissible and which are not. Are expectations, emotions, social norms, and happiness part of economics, or should economists restrict themselves to choices and revealed preferences? While Gul and Pesendorfer (2005) propagate “mindless economics”, behavioral economics and “psychology and economics” (shaped by the work of psychologists Daniel Kahneman and Amos Tversky) have gained

importance not only in terms of the sheer number of publications, but also in terms of influence in the field.

I would like to make two points regarding the criticism by Gul and Pesendorfer. First, after having established that people make mistakes which harm them, this cannot be ignored by designing policies as if the choices were utility maximizing. Thus, the policy-maker has to take such behavioral patterns into account in order to evaluate different measures. In addition, insights from psychology or neuroscience can be useful to explain behavior in a parsimonious way even if such evidence is not able to refute economic theories. Complicated models of rational agents devised to explain the behavior observed in experiments are often far-fetched. They are an intellectual exercise, but often fail to identify the true causes of behavior.

**Claim 3:** Although revealed preference theory is a useful simplification in some circumstances, it is overly restrictive regarding the scope of what economics has to say.

But the logical consequence of the psychology and economics movement is not therapy. One possible alternative is “libertarian paternalism” (Sunstein and Thaler, 2003). Libertarian paternalism starts with the assumption that people often do not make the choices that are best for them. For example, people often err on how much and how they should save for retirement. It proposes to design policies that do not harm rational people but help those who are unable or unwilling to choose the right option for themselves. Thus, economics and psychology has opened up a whole new area of research by demonstrating the inadequacy of economic policies that build on the presumption of utility-maximizing choices by economic actors. Instead, policies must be developed that help agents who are not perfectly rational to make good choices. This can be a difficult task, but it deserves careful study.

Given the advances of economics in understanding human behavior, why did the financial crisis hit most economists so unexpectedly? Or, as the Boston Globe in December 2008 quotes David Laibson, an economics professor at Harvard: “There are very, very, very few economists who can be proud.”

Without doubt, a number of features of human behavior observed in experiments helped create the crisis: a bias for the present and neglect of future events, peer pressure, overconfidence, an underrating of the odds of bad things happening. In recent years, clear progress has been made with respect to a better understanding of such behavioral patterns, mainly with the help of experiments. But also field data from seemingly exotic contexts have

been studied in order to better understand individual behavior, for example Sumo wrestling, the choices of street criminals, game shows, internet dating, football, etc.

Arguably, a loss of attention to more complex problems has been the result of this fascination with unconventional datasets. Therefore, the question naturally arises whether experimental economics has contributed to the inability of economics to prevent and deal with the crisis. The fascination with the performativity of experiments itself might have distracted researchers.

**Claim 4:** The recent focus on individual behavior, experiments and psychology has led many economists to turn away from macroeconomics and finance questions.

It could be objected that many behavioral economists strive towards a theory of human behavior that would also encompass behavior on financial markets and macroeconomics. In other words, “The Holy Grail of behavioral economics is a universal theory of human behavior that applies to all circumstances” (Schmidt, 2009). But it is questionable whether this goal can be achieved at all. One problem is that the theory of human behavior has to be very simple to be applicable in various contexts. Behavioral economics has not yet seriously developed a theory that can be used for financial markets or for a new macroeconomics. Thus, one possible qualification of Claim 4 is that experiments have not prevented the crisis because experimental economics is not yet mature enough.

Given this failure, where should experimental economics go? One possibility is to acknowledge the limited scope of experimental methods as an academic exercise with high internal, but low external, validity. In the long run, this would mean less money, less space in top journals for experiments, etc. The alternative is to use experiments together with field data and theory to search for answers to pressing social and economic problems. For experimentalists to have more to say e.g. about the financial crisis, I believe it is necessary that they do not view themselves as mainly producing knowledge about human behavior in general, but that some of their research is guided by specific problems in any applied field of economics.

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