

Symposium

Challenges and Opportunities in Economics Experiments in Virtual Worlds

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Economics research in virtual worlds presents opportunities that go far beyond what is possible in the laboratory but also presents new challenges and perils. The purpose of this article is to introduce the works in this special issue, each of which addresses different aspects of virtual world research in terms of new opportunities and insights as well as new sets of concerns.

1. Background

Virtual worlds have been recognized as a source of economic insights for at least 10 years (e.g., Castronova 2001). Since then many new virtual worlds have risen, others have declined or disappeared, and yet others have evolved, particularly in terms of their economies.¹ Despite the ups and downs, the populations of virtual worlds are growing at a steady pace. Kaneva, a recent social networking site with three-dimensional interactions, reports 1.5 million users. South Korean Lineage, a medieval fantasy world, reported at one point more than 3 million subscribers, most of them located in South Korea, but this number has since dropped considerably. The publishers of the role-playing game *World of Warcraft* report 12 million active subscribers. *Second Life*, a virtual world dedicated more to commerce and social interactions and less to role playing, recently reported around 13 million residents, but the number of active users, harder to gauge as a result of free membership, is likely far smaller. Thus, virtual worlds clearly merit serious research by social scientists, and questions addressing important legal, ethical, taxation, and economic issues pertaining to virtual worlds have been explored in the academic literature (e.g., Castronova 2001, 2002, 2004, 2005; MacInnes 2006; Malaby 2006).

In this article and this symposium issue, the focus is on economic experiments, including one natural experiment. One of the goals of experimental economics is to map demographic and situational characteristics as well as economic incentives to economic behavior through simple and replicable economic games. Thus, some virtual world experiments involve the use of virtual worlds as a laboratory. This can be done with the introduction of economic games studied in the laboratory to virtual world conditions, with attention to the particular environments, inhabitants, features, contextual effects, and norms of virtual worlds. Studies such as those of Atlas (2008); Atlas and Putterman (2011); Chesney, Chuah, and Hoffmann (2009); Fiedler (2009); Fiedler and Haruvy (2009); Fiedler, Haruvy, and Li (2010); Fullbrun,

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¹ For example, *Eve Online*, a virtual world in a universe of 5000 solar systems with 220,000 subscribers, publishes a quarterly economic newsletter analyzing economic trends in the game.

Richwien, and Sadrieh (2011); and Spann et al. (2010) have brought the dictator, ultimatum, and trust games to virtual world environments. These authors have explored whether these games, when played in virtual worlds, exhibit similar patterns to those observed in the laboratory. They further explored how particular features that are critical in virtual worlds, such as communication and social interaction (Fiedler 2009; Fiedler and Haruvy 2009; Fiedler, Haruvy, and Li 2010) or contextual cues (Atlas and Putterman, 2011), affect outcomes.

Fullbrun, Richwien, and Sadrieh (2011) run a trust game in Second Life and offer a review of the literature on trust games run in virtual worlds, as compared to findings in non-virtual environments. They find evidence for less investment by virtual world investors compared to non-virtual environments, but they also find higher proportional returns by the trustees in the virtual world compared to non-virtual experiments.

The interest in comparing virtual to non-virtual environments is not limited to comparisons between abstract physical lab experiments and the virtual lab. Comparisons can also be made on the realism with which participants in virtual experiments perceive the environment. Thus, whereas the general task in the physical lab is to create an abstract representation of a decision-making environment, a possible goal in the virtual lab is to create the decision-making environment in a manner that is as close in perception as possible to the actual decision-making environment the participant would face in the physical world (Harrison, Haruvy, and Rustrom, 2011). Virtual world economies could also be studied (and implicitly compared to non-virtual economies) through natural experiments generated by changes in the regulatory structure of economies in virtual worlds (Bloomfield and Cho 2011). The studies in this issue were selected to cover these different perspectives.

In summary, the purpose of the present symposium issue is to explore the scope as well as the opportunities and perils of economics studies in virtual worlds and to introduce opportunities for experimental research in virtual world and virtual reality research. A corresponding sponsored session was organized in the Southern Economic Association meetings in Atlanta in 2010, entitled “Experiments in Second Life.” The critique presented in that session by Glenn Harrison and Lisa Rustrom represents one of the articles in this issue. Five sets of authors who are pioneers in virtual world economics research were selected, and the articles were externally reviewed according to the standard policies of the *Southern Economic Journal*.

2. Articles in the Special Issue

Duffy

Duffy reviews the opportunities and perils in virtual world experimental research based on his experience in conducting virtual world research as well as an unannounced visit to the Brown-Tufts Experimental Economics Laboratory on Linden Lab’s Second Life on February 1, 2008. The visited experiment was a study by Steve Atlas, who was then a graduate student working with Louis Putterman. That visit resulted in an earlier working version of this article, which critiqued virtual labs and questioned the validity of demographic information collected in virtual world experiments.

On March 12, 2008, Tom Chesney started a discussion regarding Duffy’s critique (Chesney 2008) on Terra Nova (a research-oriented Weblog on virtual worlds), which for a

while was Google's top hit for the phrase "Lying Online" (referring to the possibility that subjects misrepresent demographic information). The blog generated an intense and fascinating online discussion and exchange of ideas about research methodology and practices in virtual worlds. The discussion culminated in a virtual world panel hosted by Robert Bloomfield and Metanomics, a business and policy-oriented Weblog on virtual worlds (Metanomics 2008). The panel included Tom Chesney, John Duffy, and Steve Atlas and resulted in an educational discussion about the methods and practices of virtual world experimental research. The three leading researchers in the field arrived in avatar form and proceeded to debate their different opinions. The outcome of this discussion is reflected in the article by Duffy as well as the article by Atlas and Putterman, both of which are contained in this issue.

Atlas and Putterman

Atlas and Putterman studied a trust game in Second Life. They found high trust and reciprocity, which helped establish the literature discussed in the previous section and the somewhat robust patterns of the trust game behavior in virtual worlds. They also report findings regarding visual and verbal stimuli, which is a topic of great potential in virtual world research. Finally, Atlas and Putterman's study represents one of the most careful implementations of virtual laboratory research, with careful attention to the perils inherent in such research, including local communication, intentional matching between subjects, unbalanced randomization into treatments, participation by individuals multiple times (by either changing avatars or IP addresses), issues with verification procedures, comparisons of reported demographics to overall demographics to check for biases due to misrepresentation or self-selection, etc. These issues are largely relegated to footnotes, but the article is very informative and forthcoming with what these issues and challenges are and how to overcome them.

Fiedler

Fiedler provides the first investigation of asset market experiments in Second Life. This research showcases the promise of virtual worlds in disentangling complex questions such as the effect of experience on subject behavior. Subject experience with the game has been shown to eliminate or drastically reduce asset market bubbles in the lab. Thus, the old conjecture was that professional traders would be less prone to bubbles, despite evidence to the contrary by Smith, Suchanek, and Williams (1988), who showed that professionals were just as prone to bubbles, and possibly more so, compared to inexperienced lab subjects. Fiedler confirms the findings of Smith, Suchanek, and Williams with experienced investors in virtual worlds and provides evidence regarding the reasons for this pattern.

Another contribution of Fiedler is that she overcomes major technical challenges, including the use of zTree in a distributed manner. It is not feasible to have subjects installing zTree on their own machines (as a result of both license and implementation issues). Fiedler overcomes this by hosting both server and clients on the university computer and having subjects remotely log in to the university computer over the Internet. The integration of zTree experiments (and therefore other licensed experimental software) into virtual world experiments is extremely useful for the adoption of virtual world research by experimental economists.

Bloomfield and Cho

One of the most influential articles involving virtual world research is that of Bloomfield (2007), which provides an overview and extends an invitation (as the title of that article indicates) for social scientists to conduct research in virtual worlds. Bloomfield describes the problem in conducting research using the traditional methods of experimental economics. Particularly, Bloomfield notes that for some goals, such as studying how regulation affects markets, laboratory experiments would need to involve participants in very complex situations and in many different roles, and these participants would have to be well trained and would need to understand complicated financial concepts. Bloomfield suggests that one way to overcome this challenge is to take the virtual world as an experimental environment: “As those familiar with virtual worlds can attest, the above description of the ideal experiment is remarkably similar to the description of a virtual world, which are themselves populated by many types of players making complicated decisions in complex institutions. Moreover, most worlds provide natural mechanisms for residents to become well-trained in a rich set of in-world skills and knowledge, so that they can behave intelligently” (Bloomfield 2007, p. 7).

Bloomfield and Cho follow this suggestion by treating virtual world asset markets as a natural experiment for study. They examine market and firm performance, trading volume, purchase activity, cash flow, the ability to raise capital, and other important market characteristics in light of the unique market structure of Second Life markets and theoretical predictions for this market. This work provides a deep and fascinating insight into asset markets in virtual worlds.

This article also sheds light more generally on regulation in virtual worlds. In its early days, Second Life was often praised for its low amount of regulation and little interference from the game company—Linden Lab (Ludlow and Wallace 2007). In an interview with the *Second Life Herald*, an independent publication in Second Life, Philip Linden, the founder of Second Life, presented a vision of total user freedom on Second Life (Ludlow and Wallace 2007, pp. 200–1). Bloomfield and Cho document to some extent the shattering of the ideal utopia promoted by Linden in those early days. In particular, the financial meltdowns and fraudulent activities, and the regulation that followed, described in Bloomfield and Cho, proved traumatic to residents of Second Life and generated a great deal of blogging and press. Thus, the ideal market design for virtual worlds remains a work in progress and a promising subject of study for economists and market designers.

Harrison, Haruvy, and Rustrom

No collection of articles on virtual world experimental economics research would be complete without a contribution from Harrison and Rustrom. Harrison and Rustrom have been pioneers in virtual reality research for many years, studying a range of issues from controlled forest fires to driving decisions. Virtual reality is not synonymous with virtual worlds, but it is one of the most critical components of virtual world research, according to Harrison, Haruvy, and Rustrom. Virtual reality is the aspect of virtual worlds that triggers the association in the participant’s mind between the experimental environment and the real-world environment it models. This is a feature of virtual world research that is not really feasible in the traditional laboratory, necessitating laboratory abstractions that may or may not be helpful. The article in this issue explains and motivates this view and reviews the relevant

literature, including offering both a critique and potential solutions for virtual world research. This article is a summary of the discussions by Harrison and Rustrom at the symposium session at the Southern Economic Association meetings in Atlanta in 2010.

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