Chapter 17

A Test of the Law of Demand in a Virtual World: Exploring the Petri Dish Approach to Social Science

Edward Castronova
Indiana University, USA

Travis L. Ross
Indiana University, USA

Mark Bell
Indiana University, USA

James J. Cummings
Indiana University, USA

Matthew Falk
Indiana University, USA

ABSTRACT

We report results of an experiment on prices and demand in a fantasy-based virtual world. A virtual world is a persistent, synthetic, online environment that can be accessed by many users at the same time. Because most virtual worlds are built around a fantasy theme, complete with magic, monsters, and treasure, there is considerable skepticism that human behavior in such environments is in any way “normal.” Our world, “Arden,” was designed to test whether players in a typical fantasy environment were economically “normal.” Specifically, we tested whether fantasy gamers conform to the Law of Demand, which states that increasing the price of a good, all else equal, will reduce the quantity demanded. We created two exactly equivalent worlds, and randomly assigned players to one or the other. The only difference in the two worlds was that the price of a single good, a health potion, was twice as high in the experimental world than in the control. We allowed players (N = 43) to enter and play the environment for a month.

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We found that players in the experimental condition purchased 43.1 percent fewer of the potions, implying a demand elasticity of -0.431. This finding is well within the range one expects for normal economic agents. We take this as evidence that the Law of Demand holds in fantasy environments, which suggests in turn that fantasy gamers may well be economically normal. If so, it may be worthwhile to conduct controlled economic and social experiments in virtual worlds at greater scales of both population (thousands of users) and time (many months).

In this paper, we consider a serious research application of virtual worlds: their use for controlled experiments. Several unique features argue for this kind of use. First, virtual worlds allow controlled experimentation at the level of an entire world. If desired, designers can fix the code so that two research environments are exactly the same, down to every leaf on every tree. Second, this technology allows truly vast research environments. If desired, a research team could create a world that covers hundreds of millions of square miles. Third, virtual worlds allow huge numbers of research subjects. Current commercial virtual worlds commonly have many millions of players. Fourth, virtual worlds allow a long time scale for research. Again, current commercial virtual worlds typically retain users for many years. One world, Ultima Online, has been in continuous existence since 1997. Finally, the people who engage with one another inside virtual worlds seem to constitute a genuine society. Casual observation reveals that, even at modest size, significant social relationships seem to develop. It appears, again to the casual observer, that friendships and reputations are forged and broken. Some individuals seem to acquire some kind of interpersonal or political power, while others are deemed “weak.” Information networks seem to be active. Perhaps most surprising, virtual worlds seem to develop internal markets, in which players trade virtual items with one another at what appear to be stable and robust prices.

More careful observation of virtual worlds tends to confirm these suspicions. In a recent study, Chesney, Chuah and Hoffman (2009) conducted a series of classic experiments from experimental...
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