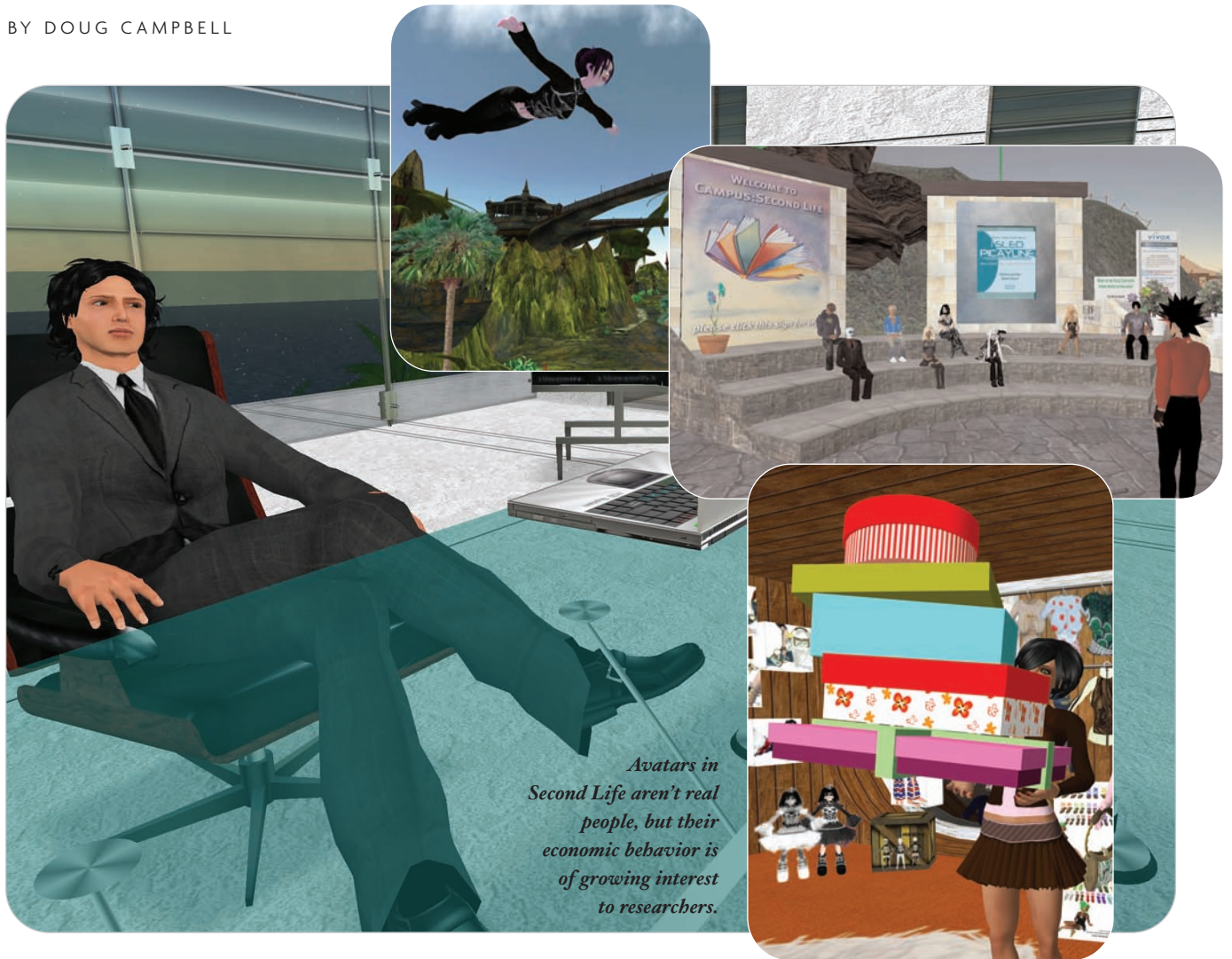


Virtual Economics

Economists explore the research value of virtual worlds

BY DOUG CAMPBELL



Avatars in Second Life aren't real people, but their economic behavior is of growing interest to researchers.

Jazmine Sciarri is a fashionable brunette who favors flared miniskirts and colorful tops. Her background is a bit of a mystery, though she has been known to dance with hippies. Curiously, Jazmine seems to be fascinated with banking. Wherever she goes, she looks for bankers. She has many, many questions for them.

Before any bankers in the audience get too excited, let it be known that Jazmine isn't real. If you've read enough stories about virtual-world gaming, by now you probably have already figured out that Jazmine is a stand-in — or avatar — for a flesh-and-blood person.

Most of the time, it might be logical to assume that Jazmine's creator was a 16-year-old boy clicking a mouse in his parents' basement. In this case, Jazmine was invented by Courtney Nosal, an economic analyst with the Federal Reserve Bank of Atlanta. Nosal is neither a brunette nor a

flower child (though for fun, she likes to visit a virtual island of dancing hippies). But she does share Jazmine's interest in bankers.

Nosal wants to talk with people who have set up virtual banks in the digital realm of Second Life, a popular Internet site. How do they attract depositors, invest their money (with the local Linden dollar currency), and make loans? If they're a lot like banks in the real world, all the better.

The Atlanta Fed is asking these questions because of the light the answers may shed on real-world banking trends. The effort is the brainchild of David Altig, the Atlanta Fed research director, who thinks virtual worlds could prove fertile ground for the study of economic policy, institutions, and crisis management. There may even be an opportunity to perform "risky" virtual-world experiments that would be unethical and impractical in the real world.

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What if the Fed unexpectedly cut the funds rate by 5 percentage points? (Let's see if that makes Jim Cramer happy, Altig likes to joke.) Inside the confines of a virtual world, where the consequences are also virtual, perhaps we can find out. "I'm not interested in studying the economics of virtual worlds," Altig says. "I'm interested in studying the real-world lessons that we might learn from virtual worlds."

Fantasy Facts

Virtual worlds can take on many forms. They can be as simple as Internet message boards, where people use pseudonyms to post political rants or riff on celebrity gossip. They can be massive online role-playing games such as World of Warcraft, in which players assume new identities and computerized bodies as dwarves or paladins and together go "questing" for gold and battle. Other virtual worlds are less game-like and more like pure social networks. There is no win-or-lose-game in Second Life except for the side matches that residents organize themselves.

Online virtual worlds have existed as long as the Internet. Early efforts included 1991's ImagiNation Network, whose dial-up subscribers could play games and interact with other players in a variety of environments. Meridian 59, which launched in 1995, is credited with sparking the explosion in virtual-world gaming as we know it today. It allowed users to create avatars that could be maneuvered about a landscape fighting monsters and chatting with other players. From there, environments such as Ultima Online, EverQuest, and the 8-million-member-and-growing World of Warcraft took hold.

With the caveat that estimates vary, the population of role-playing virtual worlds such as those described above is about 30 million and growing. The first economist to get widely noticed for studying virtual worlds was Edward Castronova of Indiana University. His research began as a lark. He decided to gather data about EverQuest players by sending

messages to two popular message boards.

In the course of 48 hours, Castronova logged 3,619 responses and put together what he called the "Norrath Economic Survey," named after the particular region of EverQuest under study. He reported population characteristics, micro-economic conditions, and macro-economic indicators. Then he posted the information as a working paper in December 2001. It was an instant hit, and Castronova's phone began to ring off the hook. A few years later, besieged by requests to expand on the subject, he wrote a book about his economic studies in virtual worlds, and now is recognized as a leading authority on the subject. "It really just started as a joke," Castronova says today. "But it continued from there."

Castronova quickly concluded that supply and demand operate in virtual worlds the same as in the real world. The "points" that players accumulate can be in the form of gold coins, "gils," or other trinkets, depending on the game. Players amass currency by killing monsters, crafting apparel, and smelting weapons, among other activities. In World of Warcraft, for example, one player may buy a shield from another player. Though the transaction is made in the local currency — gold coins — buying and selling of the coins also occurs outside the game at Internet auction sites. Players swap real currency for virtual currency through an online retail site, then have their avatars meet in some prearranged virtual location to swap the goods. (The difference between real and virtual currency is a topic that could fill the pages of a book, for how is a Linden dollar any less currency than a U.S. dollar if people use both as units of exchange?)

The existence of such clear economic behavior has convinced Castronova that virtual worlds may — but don't always — provide venues for economists to learn things about economic activity that they otherwise couldn't. Traditionally, economists have relied on 1) theoretical models

that require perhaps imprecise abstractions and assumptions about human behavior 2) statistical regressions of past economic activity, which may fall short because changing the rules of the game will probably mean changes in future behavior, rendering the lessons from the past moot, and 3) experiments with groups of people in random and control groups, which tend to suffer because of the small sample sizes and unrealistic environments.

Virtual worlds are different. With so many players acting in purposeful ways toward common goals, collectively they can be thought of as representations of human society. It may not matter so much that the synthetic version is a realm of elves and warlocks, or of uncommonly slim, attractive, and fashionable digitized humans who can also fly. Or that people think of their avatars differently than their regular selves (a reported 25 percent of gamers switch genders with their avatars, for instance). True, there are differences — barriers to entry are clearly lower in virtual worlds, as are the opportunities to cultivate economies of scale in worlds with basically boundless supplies of content.

What's important is that the societies which form in these virtual worlds are — for all intents and purposes — real. People talk, form relationships, buy things, and sell things. What's more, these are controlled environments, making experimentation much easier.

"Given this level of control, an easy yet breathtakingly powerful research strategy almost immediately leaps to mind," Castronova wrote in a 2005 paper. "Build several synthetic worlds in exactly the same way, except for some difference in a variable of interest... attract people into the worlds, sit back, and watch what happens."

Not Quite Funny Money

At the Atlanta Fed, Altig cautiously agrees with that assessment. He looks at virtual worlds and sees different

monetary systems and different institutions and wonders: What if different outcomes in prices and inflation in those worlds could be tied to the existence of particular institutions and the rules that govern those institutions? “The big payoff would be to populate a world and observe the outcomes under different institutional, banking, and payments arrangements,” Altig says.

At first glance, the world of Second Life looks like a promising candidate for such a project. It is one of the fastest-growing, massively multiplayer online sites, with more than 12 million residents.

Unlike other popular Internet realms, Second Life is not exactly a game, per se. It’s basically an artificial universe for people to meet, interact, and possibly do business together. (Plus, Second Lifers can fly, a fun bonus.) Most of the environment is created by players themselves — from digital night clubs to shopping malls. In all of these subenvironments,

Second Life residents can talk to each other, either through instant messaging, traditional e-mail, or microphones that transmit players’ actual (though sometimes purposely distorted) voices.

In Second Life, there is no stated purpose that requires the accumulation of Linden dollars. But all the same, players who want to buy virtual property or don fancy hats must pay. They can earn money by taking virtual jobs, or by paying for Lindens with real-world currency.

Some 4.3 billion Linden dollars were in circulation as of February, trading at about 265 Lindens per U.S. dollar. Though real-to-virtual world transactions occur across just about all synthetic environments, Second Life actually encourages the exchange of its currency for U.S. dollars. (The emergence of the “gold farming” industry is probably the most infamous example of the crossover between real and synthetic economies — in China, many businesses hire gamers to obtain gold

coins in World of Warcraft and then sell them for real currency.) It keeps a Lindex market board where traders can see the going exchange rate. Real banks — and many other commercial enterprises, from Toyota to IBM — have also set up sites in Second Life and other places, but these tend to be little different than existing Internet offerings.

Among the most intriguing user-created businesses that have sprouted up in Second Life are banks — or at least, virtual institutions that call themselves banks. An estimated 100 self-identified banks were in operation last year, most offering depositors certain rates of return on their Linden dollars, and some making loans to Second Life residents for mortgages or business ventures. These banks set up ATMs around the digital world; customers could deposit their money there in hopes of collecting promised interest payments and then withdraw when they needed to make transactions with other players.

The Adventures of Deeter Gumbo

Deeter Gumbo, my Second Life avatar, is a klutz. And painfully shy around attractive strangers, of which there is no shortage in the virtual world. But for all his faults, he’s good at making a quick buck. I mean “Linden dollar.”

I had never set foot in a virtual world before February. I opened a Second Life account with a single mission — to find a bank (or at least something calling itself a bank), deposit some money, and make an investment in a business. Here is the surprisingly short-lived story of how it happened:

8:05 a.m.: Opening an account in Second Life is a snap. You first choose your avatar’s name — the first name is whatever you want; I chose Deeter because, because ... Upon reflection, I have no idea. Perhaps it’s because I always liked that Mike Meyers character of the same (if differently spelled) name on Saturday Night Live. “Gumbo” was picked from a drop-down menu of semi-ridiculous last names that Second Life mandates you to use. Then it’s just a matter of entering your birth date and e-mail address.

8:10 a.m.: Now to select my avatar’s body type. This is something I’m told that can be changed anytime, but to get started Second Life provides a small sample of selections.

I chose “city-chic male,” who sports a thick, curly head of hair and a goatee.

Second Life then asks if you want to join as a “Premium” resident, which gets you some land and more L\$s for a small monthly or quarterly fee (\$9.95 per month for the highest level). I decide to join with a free account, since this way I would enter the world penniless and have to climb my way out of poverty through good ‘ol American pluck.

8:15 a.m.: After downloading a software application Deeter appears in what looks like a courtyard, a half dozen or so other people standing around him in circles painted on the virtual ground. This is the tutorial part of Second Life, where you learn how to walk, fly — yes, fly! — talk with other avatars, and pick up and wear items. Most of the time, the only view I have of my avatar is from behind. Despite my efforts, Deeter unfailingly bumps into walls, even in wide-open alleys. And it takes 10 minutes to figure out how to pick up a torch.

8:35 a.m.: A couple of knights give me a chain mail shirt. This puzzles me, since I was led to understand that Second Life wasn’t one of those go-to-battle role-playing sites,

In Second Life, there is no deposit insurance, no oversight, and quite a bit of opacity in how the banks do business. If bankers wanted to take depositors' money and run, they could do so with little fear of repercussion — other than the hit to their reputations (which are very important in online worlds) that would make it difficult for them to conduct business as bankers in the future.

Linden Lab, the company that owns and operates Second Life, was forced to reconsider the freewheeling banking market in August 2007. Ginko Financial, a Second Life bank offering returns of 40 percent, suddenly declared itself unable to repay depositors 200 million Lindens, or about \$750,000 at the time. The bank owner, whose identity remains unknown, did not say what caused the shutdown.

Many Second Lifers downplay the significance of the crash, saying that Ginko was an obvious fraud and aberration. All the same, Ginko's failure was just one of many reported banking

troubles in Second Life. Bank runs were rampant. So in January, Linden Lab said it would prohibit "banks" or any other entity from offering interest on investments "without proof of an applicable government registration statement or financial institution charter." What this means is that now only real banks can gather deposits and make loans in Second Life. As of February, none did. (Among the obstacles to virtual banking are real-world money laundering laws that require banks to know their customers, which is difficult with anonymous avatars.)

"Usually, we don't step in the middle of Resident-to-Resident conduct," the company said. "But these 'banks' have brought unique and substantial risks to Second Life, and we feel it's our duty to step in. And Linden Lab isn't, and can't start acting as, a banking regulator."

Jazmine's Quest

In so much as Second Life banks resemble real-world banks operating

in nearly regulation-free environments, the opportunities for economic research may be vast. Altig frames the question: "The big thing is, are these banks institutions that we can map into something we recognize in the real world and can therefore draw conclusions based on things we see happening in Second Life?"

That's what Courtney Nosal — or Jazmine — is trying to find out. Plugging in the term "bank" to Second Life's search engine, she tracked down more than 100 residents who, at one point or another, claimed to be bankers in the virtual world. Most were not quite banks as we know them on "earth." They mostly exchanged U.S. dollars (or other world currencies) for Linden dollars. Some would take their depositors' Linden dollars, convert them to U.S. dollars, and invest them in real projects or stocks, hoping to make good on their promised interest rates.

Nosal contacted them with messages sent through her avatar, identifying herself as a Fed researcher:

but no matter. Then it's off to change my appearance. I decide to give myself an enormous rear end and tiny head. Plus a square chin.

8:45 a.m.: After learning how to use the search box, I am awarded the ceremonial "Key to Second Life." I type in "bank" in the search engine and teleport myself to a likely suspect — SL Cap Exchange. About a half dozen avatars are wandering about, several speaking to each other in what looks like German. (Their dialogue appears in script over their computerized bodies.)

8:50 a.m.: The exchange has an ATM but I realize I have no Lindens to deposit. I teleport myself to the help island and say to nobody in particular, "How can I make some money?" A friendly guide sidles up to me and replies, "Search for jobs." So I type "jobs" into the search box, and a list of hundreds of opportunities appears.

9 a.m.: I'm on Job Island, I think. A wall of flashing billboards captures my attention. "Click Here for Free L\$\$s" says one sign, so I do. After a moment, I'm wearing a digital sign that says "Click Me for L\$\$s." Supposedly I will get Lindens if I can persuade others

to click me. It's unclear why anyone would want to do so (and in fact, nobody does during the next hour). While I'm trying to figure out what to do next, a stunning red-head approaches me and says "Hi." Terrified, I scurry away. Second Life, bah! This is just like my real life.

9:05 a.m.: "Use These Machines for Free L\$\$s" beckons a row of ATMs. Clicking on them, a Web page appears with a list of surveys and offers that I can complete in exchange for Lindens. At this point, I'm no longer really in a virtual world, just the regular online world, where commerce dominates. Dozens of sponsors — ranging from Red Lobster to XM Satellite Radio — ask for a little personal information in exchange for Linden dollars. I pick one, enter as little information as possible, and then L\$15 materializes on my person.

9:15 a.m.: Back at the SL Capital Exchange, I deposit L\$10 in the ATM, and then pull up a page of business prospects. I choose "hoorenbeek," ticker HBK, a "quality clothing and accessories" firm, and invest L\$4.20, for four shares. That's a total investment of 1.6 U.S. cents. Mission accomplished. Now, I can just wait for my riches.

— DOUG CAMPBELL

Jasmine Sciarri says: Hi, I'm from the Federal Reserve and we are very interested in the current banking atmosphere in SL. I'm interviewing all of the bank CEOs, and your participation would be highly appreciated.

Jasmine received dozens of replies. In follow-up messages, she revealed her real name and outlined the Fed's reasons for conducting the study. She queried about deposit levels, interest rates, and bankers' preferences on regulations. The goal at this early stage was to delineate Second Life's banking industry. A fairly robust industry might allow for the sort of experimentation that Altig envisions.

Early returns suggest that experimentation may have to wait. Since the de facto ban on banking, the number of self-identified bankers in Second Life has dwindled to about 10, Nosal learned. A representative sampling of her findings:

- BCX Bank — still operating, no deposits
- SLIB Bank — no longer taking deposits, most clients are shareholders
- Ginko — no response.

Among the bankers who endure, a clear sentiment prevails — they want regulation as a way to weed out scam artists and knowledgeable bankers. During runs, many bank CEOs ended up paying depositors out of their own pockets. “Most of them lost count of how many runs there have been,” Nosal says. “People have lost faith in the banking system because there were so many banks that were just scams.”

It's a fundamental economic question: What is the minimal rule of law needed to create and sustain a thriving community? Can you do it without regulation? To Altig, the early evidence from Second Life confirms what economists generally agree upon today. “Some amount of regulation appears to be necessary to

stabilize the banking system,” he says.

Fuzzy Line

Skeptics have a number of reasons to question the value of virtual worlds for economic research. There is the problem of selection bias — a majority of online gamers are young and male. Then there is the evidence that people in virtual worlds behave differently than they would in the real world; they take more risks, for example. In real life, a person likely wouldn't plunge a dagger into another person's heart, but in virtual worlds, a warlock wouldn't think twice about it.

But these are hardly insurmountable hurdles. Economists are accustomed to adjusting for selection bias and tweaking their models to fit the expected behavior of agents. Castronova, whose work helped call attention to the research value of virtual worlds, is optimistic that much more can be learned.

“Some people look at virtual worlds as space that is ‘other,’ and others see it as an extension of reality,” Castronova says. “I believe it can be both. If you change the rules of the game, change the institutional structures where people live, their behavior will be different. ... Does that mean our theories of economic and social behavior are wrong? No. They just manifest themselves differently in different environments.” And in fact, the different ways that behaviors manifest themselves is what economists are hoping to see — because perhaps they can learn what is causing those different behaviors by pulling different virtual-world levers.

Yet the research value of virtual worlds like Second Life may already be in jeopardy. As the line between the real world and the virtual world blurs, so, too, does the rationale for conducting virtual world experiments in the first place. The worth of virtual-

world experimentation is the ability to control the institutions, be they those involved in the payments system or central banks. The results from those sort of experiments should be quite clean. But if Second Life ends up with nothing more than real-world, brick-and-mortar banks setting up digital ATMs, then how different is that from existing Internet offerings?

Perhaps Second Life will evolve into nothing more than a fancy Web browser. And at that point, the services in Second Life wouldn't really be any different than those that are already provided in the real world. “We have lots of real-world data, so if all we get out of Second Life is more real-world data, it's not as significant,” Altig says.

Which is not to say that economic research with virtual worlds is dead before it even started. The Atlanta Fed's effort is still in its infancy. Nosal didn't begin her Second Life work until January, though Altig has been thinking about the effort for a couple of years now, back to the days when he worked for the Cleveland Fed.

At the least, virtual worlds may provide ample data for economists to mull over. Analysts at the Cleveland Fed — some of Altig's former colleagues are hoping that Nosal can gather enough data through surveys of Second Life users to produce meaningful research. In theory, they could study much more than banks for real-world lessons about the economy. But they started with banks because they seemed at first like they might bear a close resemblance to real-world banks.

“I think that something will come of this. Whether it will be a marginal addition to our knowledge base or something more substantial is a wide-open question,” Altig says. “But it's a question worth asking and exploring.” **RF**

READINGS

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