WEBPONDO INTERVIEW WITH SHYAM SUNDER

Webpondo: It shouldn't come as a surprise that experimental economics is quite an unknown field for Colombian economists. Just to warm up the readers, could you briefly explain us what the idea of experimental economics is and its importance?

Shyam Sunder: Economics is the science of interaction between human wants and scarcity within the context of social institutions. On aggregation scale, it is bounded by psychology--the science of individual behavior--at one end, and sociology at the other. Economists seek to learn about the outcomes of such interactions under various circumstances and institutions. Verbal, mathematical and econometric analyses have been the traditional tools of this trade, each with its own advantages and limitations. During the past half-century, experiments have been added to this toolbox. Experiments are a especially powerful means of learning about the role of institutions in determining the outcomes of economic interactions.

W.P: Can experimental labs replicate real-life problems? Specifically: in real life, people regularly face choice problems with enormous consequences for them; can one really trust that individuals who participate in experiments will consider the situation there as seriously as they would in real life? For example, in an auction experiment for sports cards, participants may bid strong just for the thrill…

S.S: When we consider the real-life phenomena in all their fractal detail, they cannot be captured in entirety either in the lab or in any other modeling medium. Real life is infinitely detailed, and no two situations are exactly alike. The very idea of modeling is to identify some features of real life as essential for a given purpose, and discard the rest as mere detail. This is valid both for mathematics as well as for lab. Experimentalists, like mathematical economists, try to capture the essential features to examine the robustness of the simple models. What is the role of the "thrill" in an auction for sports cards (as opposed to the monetary payoffs)? If the thrill is thought to be an essential feature in real-life auctions, the lab auction should also try to capture it. If the model being examined ignores the thrill factor, and the lab results reveal thrill to be an important determinant of the outcomes, the model is shown to be deficient in its explanatory power. In either case, the lab experiments help us refine our understanding of real phenomena through better and simpler ways of capturing their variation in our models.

W.P: From the point of view of experimental economics what does it mean to empirically test a theory—a single theory or multiple theories?

S.S: Theoretical models are built on many assumptions; some are essential to the environment being modeled while others are simply assumptions of convenience. If all assumptions of the model were valid in the lab, the only reason for the lab outcomes to deviate from the model predictions would be an error in the model. Lab experiments are not an efficient way of discovering

mathematical errors in models. Lab testing of theory means to design lab environments, which systematically deviate from the model by progressively weakening the assumptions of convenience. If the weakening of the assumptions of convenience is associated with a rapid drop in the correspondence between model predictions and lab outcomes, the model is revealed not to be robust. If, on the other hand, this correspondence holds up well, the model is revealed to be robust. Help in identifying robust from not so robust models, and in identifying essential from convenience assumptions, is what we mean by "testing" a theoretical model in the lab. Indeed some of the best-known economics experiments (e.g., Smith JPE 1962) had such a great impact because they revealed certain models of economics to be robust beyond the expectations of many economists.

Testing a single theory means to assess the robustness of its predictions with respect to weakening its assumptions of convenience. The more the accuracy of the predictions of the theory holds up as the lab environment deviates increasingly from the assumptions of convenience, the more generalizable and believable the theory is. Across two theories, we can compare the robustness and generalizability in a similar fashion.

W.P: Let's get more into the details. Could you briefly sketch the prototypical experiment in which you, with several co-authors, have tested different monetary theories? What conclusion can you draw regarding the role of indeterminate monetary equilibrium and sunspots?

S.S: Indeterminacy of equilibria has been a major issue in monetary economics. Selection of one, or a subset, from many or a continuum of, equilibria would help us use such models as tools for guiding policy and making predictions. The mathematical plausibility of multiple equilibria rests on various plausible ways in which economic agents may form their beliefs about the future states of nature and about the behavior of others, and on institutional arrangements under which individual actions may interact with one another to yield the aggregate level outcomes.

Economics experiments have helped identify the institutionally and behaviorally plausible subset of equilibria. These series of experiments implemented the concept of overlapping generations in laboratory, and can be briefly described as follows. We recruited some 12-15 students without prior knowledge of monetary economics and formed cohorts of 3-4 students to constitute a generation. When a student entered the game in, say, period t as "young", he received a large endowment of a "consumption" good but no money. He could "consume" all the endowment in this period, or offer to sell any part of it to the members of the "old" generation in exchange for money. The "young" carried the cash proceeds of their sale to their "old" period when they could use the money to buy the "consumption" good from the newly entering "young" generation. at the end of period t+1 when they "died", and exited the game for a randomly determined number of periods, the students were paid cash in proportion to the product of the quantities of the good they "consumed" in their young and old periods. In each period, a non-participating group of students predicted the market-clearing

price of the consumption good, and their average prediction was used to settle the accounts at the end of the final period.

We found the first evidence in data that sunspot equilibria based on extrinsic uncertainty are plausible. We also found that multiplicity of theoretical equilibria is not necessarily reflected in data gathered in the lab.

W.P: What about the different learning mechanisms that exist in the literature for example, rational expectations or adaptive learning?

S.S: We have found that laboratory economies tend towards equilibria, which are stable under adaptive, not rational, expectations formation process. Though there is some evidence on agents anticipating the future, within the lab environments, which allow only a limited amount of learning, adaptive models of learning organize the data reasonably well.

W.P: Let us consider some implications of your work for monetary policy. It has been argued that simple rules as Friedman's constant money growth rules or Taylor rules (more specifically, forward-looking rules as proposed by Clarida, Gali and Gertler) can help coordinate agent's beliefs and help stabilize the economy. Some of your work is at odds with the theoretical work regarding, in particular, Friedman's rule. What about these other rules? What is the importance of these results?

S.S: We did some experimental testing of simple policies such as constant money growth rule and target inflation rule. The preliminary results yield some weak evidence that such policies can help coordinate agent beliefs. The data provide surprisingly strong support to the importance of stability parameters in determining the volatility of the economy. However, in order to translate these findings to policy recommendations, I would feel more comfortable if we (and other economists) conducted additional testing and verification of these results in a variety of laboratory conditions to ensure their robustness. Still, given the difficulty of conducting field experiments in monetary policy, and the theoretical indeterminacy of equilibria, our experimental data are the only available empirical results.

W.P: Thinking a little bit about what remains to be done in experimental economics, imagine that a young and arguably brilliant economics PhD student suddenly breaks into your office at Yale and says: "Professor Sunder – Please give me a good and important problem for me to solve as my PhD dissertation." What would you tell him?

S.S: I avoid handing out problems for PhD students to solve as their dissertations; identifying the problems worth solving is more than half the training, I dare say the more important half of their training, in graduate school. But I can turn your question to what I consider the most important work to be done in experimental economics. We can use experiments to identify the structural properties of economic institutions. Increasingly in the recent years, especially with the influence of game theory, economists' attention has shifted to individual behavior as the key determinant of economic outcomes. The

importance of individual behavior diminishes as the number of agents who interact in an institution increases. I see characterizing the institutional outcomes as a function of their structure as the most important item of my experimental research agenda. While some progress has been made towards this goal during the past ten years under the label of "zero-intelligence" work, much remains to be done.

W.P: You mean, characterizing economic outcomes depending of different institutional arrangements among agents? For example, outcomes depending on the existence of a price auctioneer or a credible central bank? What does it mean "zero-intelligence work"?

Yes, institutional arrangements among agents. In a remarkable issue of the Journal of Political Economy in 1962, two articles were published. In one, Gary Becker showed that downward sloping demand and upward sloping supply functions do not need be derived from optimization by individuals; simple consideration of agents' opportunity sets under changing prices are sufficient to yield the appropriate slopes even if the agents chose randomly from their opportunity sets. In the other article, Vernon Smith reported that double auction markets with some half-a-dozen student traders motivated by profit and possessing little information beyond their own reservation values quickly converge to Walrasian equilibrium prices and allocations. While Becker pointed to the possibility of freeing market equilibrium under classical conditions from optimization by agents, Smith showed the relevance of equilibrium to the real life market institutions. In a third paper, Gode and Sunder (JPE, 1993) combined random choice within opportunity sets with recognizable market institutions. Their computer simulations of markets with "zero-intelligence" traders showed that the allocative efficiency of competitive markets is largely free from individual intelligence or strategy and depends almost entirely on the rules of the institution.

W.P: Turning now to more personal questions, who have been the most influential people in your career?

S.S: My teachers (Yuji Ijiri, Herbert Simon, and Robert Lucas at Carnegie Mellon University), my colleagues (Charles Plott at CalTech, Vernon Smith at University of Arizona, and Ramon Marimon at Universitat Pompeu Fabra) and my students (Dhananjay K. Gode and Karim Jamal) have been most influential in my career. My father gave me a way to look at the world and my role in it, and my brother set the example of aiming high.

W.P: As you might already know, in Colombia we have a huge problem regarding drug-related illegal economic activities. Besides the traditional costs these activities impose on society, we are exposed to high levels of corruption, the financing of guerrilla armed groups, etc. What do you think about legalizing and regulating illegal drugs?

S.S: A group, organization or country can be said to be in control (or balance or equilibrium) if its members find it in their own interest to do what the other members expect them to do. The drug trade has destroyed this balance between

self-interest of some, and the expectations of the others in Colombia. Colombia's internal enforcement mechanisms to restore the control or balance have not worked because the economic incentives induced by high international prices do not allow for an equilibrium government or social enforcement structure. Lowering the international prices of drugs is, perhaps, the only feasible solution for Colombia. This would require either enforcement or legalization in the consuming countries; neither is politically easy to do.

W.P: A few months ago you visited Colombia invited by the National University of Colombia. What impressions did you get from your short visit to our country?

S.S: Colombia is the only country in which I heard people unabashedly praising the politicians in national, even local, office. The current and recent mayors of Bogotá were specially admired. Given the corruption and inefficiencies that pervade local governments around the world, it was pleasing to see how well the city of Bogotá is run, and is getting better.

W.P: Thank you very much Professor Sunder.