Bounded Rationality: Theory and Experiments

Expectations, Social Influence and the Economy (ExSIDE) program

University Ca’ Foscari, 9 – 13 October 2017

This course focuses on selected models of bounded rationality of financial markets and their validation in experimental laboratory. We will cover such key concepts of bounded rationality as K-level of thinking theories and reinforcement individual learning theories. Paying special attention to validation of the theories using experimental data, we will review recent experimental work on trading in financial market, expectation formation, and adaptation. In analysing the models and experiments apply some tools of nonlinear dynamics theory will have to be used.

Key topics:

- Bounded rationality, expectations and learning
- K-level of thinking theory
- Economic experiments of financial markets
- Bubbles and crashes in the models and labs
- Heuristic Switching Model, its estimation and validation
- Individual Evolutionary Learning model

Instructor:

Mikhail Anufriev, University of Technology Sydney (UTS)
Mikhail.Anufriev@uts.edu.au or m.anufriev@gmail.com

Program (preliminary):


Literature:

Methodology of Experimental Economics


Day 1


Day 2


Day 3


Day 4


Day 5


Other suggested reading:

Day 1:


Day 2:


Day 3:


**Day 4:**


**Day 5:**


Bounded rationality thinking is limited by the available information, the tractability of the decision problem, the cognitive limitations of our minds, and the time available to make the decision. This type of thinking is called "satisficing," or doing the best you can with what you have. The ideas of bounded rationality and satisficing are now widely accepted, and its insights are fueling research throughout the social sciences. Understanding bounded rationality and satisficing as two principles that are at play in decision-making and judgment in the homeland security ecosystem is important because in complex, fast-moving environments, practitioners of the security arts can be bounded to decisions that use both heuristics and biases. Bounded Rationality is a behavioral bias that occurs when human decision-making process attempt to satisfice, rather than optimize. According to the decision-making process of bounded rationality, we are not inclined to find out all the necessary information that would be required to make a rational decision, because of cognitive and temporal limitations. This causes us to make choices that are satisfactory rather than optimal. Our choices are still rational, considering the information that is realistically available to us, but may not be rational in lieu of all the possible information and resources. Theories of bounded rationality have been applied to diverse political contexts such as elections and budgeting; these models are briefly described. Much of the available evidence comes from experiments using the p-Beauty Contest game (although the typical findings replicate also in other tasks; eg, Arad & Rubinstein, 2012; Lindner & Sutter, 2013). In the p-Beauty Contest game, players choose a number between 0 and 100; the winner is the person who chose the number that is closest to a fraction p (eg, 2/3) of the average number chosen in the group. Across different samples that vary in national culture, age, and occupation (including high-school students, CEOs, portfolio managers, economics PhDs, and. "Bounded rationality" has since come to refer to a wide range of descriptive, normative, and prescriptive accounts of effective behavior which depart from the assumptions of perfect rationality. This entry aims to highlight key contributions from the decision sciences, economics, cognitive- and neuropsychology, biology, computer science, and philosophy to our current understanding of bounded rationality.

1. Homo Economicus and Expected Utility Theory
   1.1 Expected Utility Theory
   1.2 Axiomatic Departures from Expected Utility Theory

Theory of bounded rationality to suggest one form of error function over another, although risk perception research suggests that humans tend to overemphasize large errors (Tversky and Kahneman 1974). Despite the lack of a significant relationship in this application, linkages between fitness function and bounded rationality may prove a fertile topic for exploration given potential ties to research on risk perception. Longer programs; otherwise, they would be culled. In another sense, agents retain their capacity to experiment and evolve programs over the full operation of the genetic programming system while maintaining short but fit programs. 4.3 Selection operator.