Neuroeconomics: The next frontiers for economic decision making

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Abstract

Neuroeconomics is an interdisciplinary field that attempts to explain human decision making while choosing between multiple alternatives to follow a course of action. It combines research from neuroscience, experimental and behavioral economics, and cognitive and social psychology. This paper gives an insight about how Neuroeconomics could play a role in human decision making.

Introduction

Neoclassical economics started with as few as one and as many as four simple assumptions which fully describes a new theory the neoclassicists developed as a framework for thinking about and predicting choice. This theory was challenged by behavioral economists who falsified one or more of the expected choices fundamental to the theory. As both groups defended their approaches, neuroeconomics has emerged.

Neoclassical economics

The heart of neoclassical revolution was in the 1930s when Paul Samuelson founded the revealed preference approach. The theory showed that even simple assumptions about binary choices indicating weak preferences could have powerful implications. An extension of these binary preferences model was presented by Houthhakker, 1950, stating that if the idea holds for binary choices among pairs of objects then some choices can be used to predict relative preferences of pairs of objects that have never been directly compared by the consumer. An example is a condition where a consumer prefers an apple over an orange and then an orange over a peach then he must not choose a peach over an apple. Later developments of the theory included choices with uncertain outcomes (von Neumann and Morgenstern's expected utility theory, EU) and where outcomes can be spread over time (discounted utility theory). The preceding theories assume that a consumer acts according to rational choice theory stating that the economic decision-making process of an individual is rational, optimizing their benefit or utility and perceiving a value of a product beyond its input costs. Furthermore, (von Neumann and Morgenstern, 1944) have laid down the foundations of game theory, in which outcomes are generated by the choices of many players.

Behavioral economics

Daniel Kahneman and Amos Tversky (1979) along with other psychologists showed in a series of experiments that many phenomena fell outside classical expected utility theory.

Therefore, a group of psychologists and economist calling themselves behavioral economists, argue that evidence and ideas from psychology could improve the model of human decision making of neoclassical economics by applying mathematical theory and experimental data on models of limits on rational calculation, willpower, and self-interest.

Neuroeconomics

By the late 1990s, the challenge between neoclassical economics and behavioral economists has emerged setting the stage for neuroeconomics. While neoclassical economists worked on improving their model, behavioral economists looked for alternative mathematical theories and different types of data to test those theories with the goal of providing an alternative theoretical approach for predicting behavior while verifying this approach. Due to the great progress achieved by economics in understanding interaction of two agent systems in the external word e.g. understanding interactions of firms and their employees, which also aligns with "dual-process" models in psychology, behavioral economists suggested moving from single agent maximizing a utility to two independent and interacting agents. An example of this dual-process model is when inefficient choice behaviors are observed between humans due to bad equilibrium caused by their own self-interests. This example, among others, show tradeoff between efficient choice and computational complexity, which might be useful to generate hypotheses about brain processes.

Behavioral economists made use of the tools of neuroscience, particularly functional magnetic resonance imaging (fMRI), to explore the "black box" that is the brain. On the other hand, Neuroscientists were interested in the structure of economic models of choice and strategy (Glimcher and Rustichini, 2004). The first neurobiological paper to rest explicitly on a normative economic theory was Peter Shizgal and Kent Conover's 1996 review, "On the neural computation of utility," in Current Directions in Psychological Science. This was followed the next year by a related paper published by Shizgal in Current Opinion in Neurobiology entitled "Neural basis of utility estimation."

Conclusion

Neuroeconomics is a recent emerging field based on neuroscience, psychology, and economics. Its interdisciplinary nature makes it a promising field for cooperation between these fields. The goal of such cooperation would be to reach best prediction of human decision making which is still in its early phase.

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