Imagination Rather Than Observation in Econometrics: Ragnar Frisch's Hypothetical Experiments

By: Catherine Herfeld

Thought experiments are conducted for multiple reasons in the natural sciences, the social sciences as well as in philosophy and have been characterized in the philosophical literature in multiple ways (Brown 2014). One well-established view is that thought experiments are primarily used in disciplines in which observation and experimentation is difficult to realize. One such discipline is economics, where the methodological value of thought experiments is frequently justified by referring to the difficulty to conduct actual experiments. It has also been argued that there thought experiments serve other functions, such as establishing causal facts, isolating tendencies, justifying social institutions and their persistence, or bridging the gap between mathematical models and reality (Maas 2014; Reiss 2012).

In this paper, I suggest that thought experiments have long had yet another function in economics. Looking more closely at the function of thought experiments in econometrics, I argue that they have been employed to bridge the gap between theoretically established relationships and their empirical testing via establishing and operationalizing unobservable economic concepts. More specifically, in economics thought experiments have allowed for explicating and operationalizing psychological concepts, such as utility. They allowed for the justification of the major postulates of human decision making that are used as first principles in economic theories. As such, they allowed for measurement of the major variables indicating human behaviour in economics and quantifying the major laws in economics without actually requiring actual experimentation into human psychology. While observation is often not only impossible to specify such psychological concepts, it is frequently also not necessary in order to use them in empirical testing.

In support of my argument, I will offer a historical case study, namely the “hypothetical experiments” of the Norwegian economist and Nobel laureate, Ragnar Frisch (1895-1973). As I will show, Frisch used this specific kind of thought experiments to justify his axioms of the traditional theory of consumer choice in his paper Sur un Problme d’Economie Pure (1926), as well as in a series of lectures that he delivered in the early 1930s. By drawing upon such experiments, Frisch aimed at eliminating the method of introspection, which was a vestige of the Austrian school and from metaphysical commitments through the use of psychological concepts such as subjective utility that hindered economics from becoming a scientific enterprise according to Frisch. At the same time, he sought to equip economic theories with acceptable behavioral foundations from which quantitative economic reasoning could be derived (see e.g. Frisch 2010 [1930], p. 82 f.).

In so doing, Frisch followed in the tradition of Irving Fisher and Vilfredo Pareto. While impressed by their developments of utility analysis, Frisch aimed at taking one step further towards freeing consumer choice theory from psychological concepts, such as utility, while nevertheless arriving at quantitative measurements of utility. Towards this end, Frisch used thought experiments to justify the set of choice axioms he introduced into consumer choice theory. Thereby, Frisch circumvented the problem of directly observing utility via actual experiments without purging the concept of utility from economic theory altogether. As such, those thought experiments helped Frisch empirically support the theory’s most important implications, such as the laws of demand and supply, without the input of new empirical findings. By demonstrating the merits of thought experiments in econometrics, this case study not only allows us to draw some more general conclusions about the nature and purpose of thought experiments. It also enables us to engage in a more general debate about the justifications of behavioral principles in economics, which exists in economics the latest since John Stuart Mill's introduction of the homo economicus and to discuss the usefulness of psychological theories for economics. Economists have for a long time been concerned with the question of how they should think about the behavioral principles as constitutive elements of their most influential theories about the economy. Thereby, they have always abstained from including psychological findings into economic theories and models or from testing their principles of human behavior themselves. Contrary to the presuppositions of many contemporary critiques of the axiomatic method in economics, the argument is that axioms of rationality, which nowadays constitute the conceptual heart of economics were not primarily aimed at adequately representing the actual thought processes of the human agent. In contrast, critics of this procedure were, and still are, particularly concerned when principles of rational behavior became axiomatized; first by Frisch and later by John von Neumann and Oskar Morgenstern.

The case of Frisch's hypothetical experiments helps us clarify the position of the economists in this debate, analyze the status of the rationality axioms in economic theories, and - against this background - discuss the recent advances in behavioral economics, i.e. the attempts to introduce a psychologically more adequate theory of human behavior into economics; to conduct experiments on human behavior in economics; and to draw extensively on psychological concepts and findings. In their function to bridge the gap between theory and data, Frisch's hypothetical experiments offer us a case that enables discussion of the question how much psychology is actually needed in economics.