

Second-Order Economics as an Example of Second-Order Cybernetics

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Heinz von Foerster proposed that the observer should be included in the domain of observation. He suggested that this approach to cybernetics be called *second-order cybernetics*. Heinz was primarily interested in understanding cognition, based on neurophysiology and mathematics. But there has also been strong interest in cybernetics as a theory of social systems. Using the “second order” idea for existing social science fields would focus attention on the role of the observer and on reflexive phenomena such as the effect of theories on what is being studied. This article considers how the field of economics might adopt the second order idea.

A Current Task for Cybernetics

In emphasizing the role of the observer and creating the term *second-order cybernetics* Von Foerster was ahead of his time. One example is the fact that the field of economics may be on the verge of beginning research on *second-order economics*. But before explaining why that is happening, some background is necessary. Von Foerster was persuaded that the observer needed to be studied as well as the observed. The traditional philosophy of science maintained that scientific observations should be independent of the characteristics of the observer. However, as Humberto Maturana noted, “Anything said is said by an observer” (Maturana, 1970, p. 4). Hence, excluding the observer from consideration is a kind of denial.

Von Foerster sustained and advanced the field of cybernetics when many others had returned to their home disciplines. Peter Asaro (2010) in an article titled “Whatever Happened to Cybernetics?” has suggested that there are three main interpretations of cybernetics. First, in the narrow view, cybernetics refers to feedback systems. This interpretation is common among those who work on artificial intelligence. Second, according to the internal view, cybernetics is associated with a subjectivist epistemology. Those committed to a realist epistemology view this line of research as a serious error. Third, according to a broad view, cybernetics can be thought of as a general theory of information and regulation similar to physics, a general theory of matter and energy. This paper takes the third view. Cybernetics can be thought of as a foundation for the social sciences just as physics provides a foundation for the engineering disciplines. Accordingly, second order economics (i.e., second order thinking within a specific field) can be thought of as an example of second order cybernetics, a more general scientific perspective.

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George Soros made the connection between cybernetics and economics, since his reflexivity theory is quite compatible with second order cybernetics (Soros, 1987). Soros has pointed out that economic systems are composed of people who both observe and participate. He emphasizes that social systems are fundamentally different from physical systems. Participants have biases, and they change their minds. Furthermore, theories not only describe the behavior of social systems, when acted upon, they also change their functioning.

Equilibrium Theory and Behavioral Economics

For many years social scientists have sought to emulate the physical sciences. Economists were the most successful. Equilibrium theory in economics uses the model of self-organization or what is currently called complexity theory (Umpleby, 2010). According to this theory, when the economic system is disturbed, it returns quickly to equilibrium. People are assumed to be rational profit seekers. They are assumed to have access to the same information as everyone else, and everyone is assumed to have complete information.

In recent years economists have been developing the idea of behavioral economics, which seeks to modify the idealized assumptions of equilibrium theory. For example, behavioral economists point out that people are often not rational, and they do not have equal access to information.

Other Assumptions Underlying Economics

There are other assumptions underlying economics and its effort to emulate the physical sciences. For example, the classical philosophy of science, which guided the development of the physical sciences, is based on the assumption that observations are independent of the characteristics of the observer. A related idea is that theories do not change the phenomenon being studied. These assumptions work in most cases in the physical sciences, but they do not fit the social sciences.

Social scientists are quite aware that social theories affect the behavior of social systems. Indeed, that is why they create new theories. They hope that people will accept the new theories, act on them, and the social system will operate better. However, when social scientists do research, they often assume that theories have no effect. Hence, there is a gap between the way social scientists think when they speak to the general public and the way they think when they do research.

The attempt to emulate the physical sciences and the apparent success in doing so, can lead to another assumption, namely that theories progress from good to better. One consequence of this idea is that the history of economic thought is no longer taught in many U.S. universities.

In the physical sciences the history of ideas is the way the subject is taught, with one theory building on previous theories. But the history of ideas was discarded in economics for at least two reasons. First, it was thought that there was not enough

time in the curriculum to teach the older ideas, since there was so much new material to cover. Second, the older theories were often described as vague or speculative in comparison with modern quantitative approaches.

If the history of economic thought is added to the curriculum once again and the consequences of theories are considered, then economics will have entered the realm of reflexivity (Soros, 1987). Taking account of the interaction between economic theories and society is what is meant by *second-order economics*. It is an effort to include the observers (i.e., economists, not just investors or market participants) in the domain of economics.

Consequences of the Financial Crisis

The 2008 financial crisis produced a rapid return to an earlier economic theory (e.g., Keynes's recommendation for government intervention during a recession). This change from the widespread belief in the near universal utility of markets has called attention to oscillations in economic thought, not just progress. Swings occur between the idea that government intervention can be helpful and the idea that markets can solve all problems. The financial crisis has called attention to the fact that economic theories do not always progress from good to better. Rather, there are cyclical swings in the theoretical position that has the most followers. Consequently, the currently prevailing theory does not make previous theories obsolete. Older theories may be needed again. Indeed, both theories may be needed in order to achieve both growth and fair distribution of wealth. The general public is quite aware of the competition between theories. There is even a rap song on You Tube about the competition between the ideas of Keynes and Hayek ("Fear the Boom and Bust," 2011).

Following the financial crisis and a renewed interest in government regulation of markets, there has been a return to Keynes's ideas about the appropriate role of government in the economy. This return to earlier ideas may lead to more attention to economic theories as fundamental parts of an economy. How the prevailing first-order theory changes is the subject matter of second-order economics.

How to Model Second-Order Economics

Currently economics is defined more by its method than by the subject matter or by events such as crises or central bank decisions. If reflexivity is to be accepted within economics, some modeling method will be needed. What needs to be modeled is the changes in point of view regarding markets and the role of government. Anatole Kaletsky (2010) has described four stages in capitalism: 1) A laissez faire approach to macroeconomics followed the stock market crash of 1929. 2) An interventionist period, based on the theories of John Maynard Keynes began during the 1930s. 3) A movement toward fewer state-owned enterprises and less government regulation was based on the theories of Frederick Hayek and Milton Friedman. 4) A return to the belief that some government regulation is necessary followed the financial crisis of

2008. Hence, there are cycles based on the temporary dominance of either government regulation or free market thinking. These *influence cycles* have a similar structure and can be modeled with the same methods as credit cycles or leverage cycles (Geanakoplos, 2009).

Economic theories can be viewed not only as descriptions but also as means for controlling the economy. Political leaders select among economic theories and choose those that benefit their constituents. This analysis is already part of political science, but should it also be part of economics? Should the use of economic theories to manage the economy be part of economics, formally as well as informally? Probably not if the current view of economics as method continues. But possibly so if the history of economic thought is reintroduced into economics curricula. Theories as part of the control system of the economy would be a part of second order economics and would be an example of reflexivity theory. Selection of an economic theory would then be a type of policy, similar to fiscal policy or monetary policy. Currently there is increased interest in comparative economics, for example, comparing the approach to managing the economy in the U.S., Germany, and China. This is one way of doing second-order economics.

The Current Dilemma

Reflexivity theory or second-order economics goes beyond behavioral economics and its modifications of equilibrium theory. There is a large difference between the idea that people are not always rational or they do not have the same information and the idea that theories affect the phenomena being studied. Acceptance of a reflexive view of economics, and other social science disciplines, has been impeded by a concern that self-referential statements lead to logical inconsistencies. Second-order cybernetics, by interpreting self-reference as occurring in time, can serve as a guide to the social sciences on how to include reflexive phenomena in their theories. Von Foerster understood the importance of self-reference and the difficulties it poses in the early 1970s. The struggle is now occurring in other disciplines. If economists decide to disregard self-reference or reflexivity, other disciplines, such as political science, sociology or history will deal with it instead.

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