

## **“The philosophy of the analysis of complex, adaptive, and bifurcating economic systems” (summary)**

The research project aims to provide the philosophical foundations for the analysis of complex, adaptive, and bifurcating economic systems (CABESs). CABES analysis differs from conventional economics (CE) in that it uses systems of nonlinear equations without analytical solutions to study (dynamical) economic systems with heterogeneous populations of directly interacting agents who modify their behavior in response to changes in systemic properties that result from changes in the environment. While CE is an old and venerable discipline, CABES analysis is still quite young; it probably has not emerged before the 1980s when the computer simulation techniques were created that can be used to study the dynamics of CABESs. And while the philosophy of CE has been a popular and industrious research area for at least 30 years, the philosophy of CABES analysis is almost nonexistent.

But a philosophical reflection of the methods and basic concepts of CABES analysis becomes increasingly important, as an increasing number of theorists call for a paradigm shift. Especially since the financial crisis of 2008-2009, many of them claim that CABES analysis outperforms CE in terms of explanation, prediction, and policy justification, and that CABES analysis therefore deserves a stronger presence in economic curricula and the faculties of economics departments. But an adequate evaluation of that claim presupposes satisfying answers to questions such as the following: How do the generalizations used in CABES analysis explain? Can they be used for predictive purposes? Do they encode the causal claims required to justify policy decisions? What type of causality operates in CABESs? While the philosophy of CE has arrived at some convincing answers to corresponding questions, satisfying answers in the philosophy of CABES analysis are still missing. And while the philosophy of CE has been able to proceed to (not always flattering) evaluations of CE methods, methodological evaluations of CABES analysis do not get off the ground.

The research project therefore aims to prepare the ground for these evaluations by investigating the metaphysics of CABES analysis. It will then carry out these evaluations by scrutinizing some of the most important computational models that CABES analysts use to explain or predict specific states of CABESs, or to justify economic policy decisions. The research project further aims to analyze the ethics of CABES analysis and CABES-analysis-based policy: Is CABES analysis likely to be influenced by non-epistemic values? What is the nature of CABES-analysis-based policy? What should be the goals of CABES-analysis-based policy? Does it rely on secure knowledge? The research project will finally consider whether we should be monists or pluralists with respect to CE and CABES analysis.