Pluralism, Complexity and Effective Triangulation of Methods:
How and when a plurality of methods helps us to better understand reality

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Placement within the summer school and learning goals

This lecture takes place at the beginning of the summer school (Monday, 9:00-13:00). It will provide students with the analytical tools from the *Philosophy of Science* to adequately assess the methods to be learned in the upcoming days. More precisely, the learning goals are as follows:

➢ Understand the link between the complexity of economies and the need for pluralism in economic inquiry;

➢ Understand why a plurality of methods is necessary, but that the triangulation of different methods also comes with challenges that must be dealt with;

➢ Learn to assess, criticize and/or justify a particular method with the tools from the Philosophy of Science. In other words: learn to assess the usefulness of distinct methods to create knowledge about your system under investigation;

➢ Understand the benefits of agent-based modeling and the other methods introduced during the summer school, in particular if compared with more established tools from economics.

Main content

The lecture consists of three parts: two larger presentations by the lecturer and a discussion-based part in the middle of the lecture:

1. ***The relationship between the complexity of economies and pluralism in economics.***
   Building upon Gräbner (2017), we will discuss ontological and epistemological justifications of pluralism, all referring to the complexity of economies. At the same time, central concepts such as "complexity", "pluralism", and "plurality" are defined.

2. ***How models can create knowledge about reality, and how to evaluate them***
   Using Gräbner (2018) as a main reference, students are introduced to the DEKI framework, which explains when models can be said to represent a target system. This entails a classification of models as 'mathematical', 'physical' or 'computational'. Based on this analytical framework the concepts of "model validation" and "verification" are introduced: we ask how we can relate models to reality and assess their empirical validity, how the model purpose dictates the adequate means to do so, and what kind of trade-offs between various model purposes (such as 'explanation' or 'prediction') exist.

3. Method bias, trade-offs in model selection, and challenges for triangulation

Extending the discussion from above we ask what happens epistemologically if a particular kind of modeling dominates other kinds *a priori.* The concept of 'method bias' to describe and assess this situation is introduced, applied to the situation in economics and the methods to be introduced in the upcoming workshops. Model pluralism and triangulation are discussed as a potential cure for method bias. At the same, they come with challenges, which – along the lines of Gräbner and Strunk (2018) - we critically reflect upon. The presentation closes with an outlook of how the methods to be introduced in the summer school can be used to meet these challenges.

Literature

The content of the lecture will be based mainly on the following papers, all of which are available through the course homepage. It is highly recommended to read the core readings in advance. The further readings are not mandatory, but can be helpful for preparing mean questions to the presenter, or to study selected topics in greater detail after the workshop.

Core readings:

Gräbner, Claudius (2017): The Complexity of Economies and Pluralism in Economics, *Journal of Contextual Economics* 137 (3): 193–225.

Gräbner, Claudius, and Birte Strunk (2018): Pluralism in Economics: Its Critiques and Their Lessons, *ICAE Working Paper* 82.

Gräbner, Claudius (2018): How to Relate Models to Reality? An Epistemological Framework for the Validation and Verification of Computational Models, *Journal of Artificial Societies and Simulation* 21 (3).

Further readings:

Dobusch, Leonhard, and Jakob Kapeller (2012): Heterodox United vs. Mainstream City? Sketching a Framework for Interested Pluralism in Economics, *Journal of Economic Issues* 46 (4): 1035–58.

Gräbner, Claudius (2016): Agent-Based Computational Models– a Formal Heuristic for Institutionalist Pattern Modelling?, *Journal of Institutional Economics* 12 (1): 241–61.

Gräbner, Claudius, Catherine S E Bale, Bernardo Alves Furtado, Brais Álvarez Pereira, James E Gentile, Heath Henderson, and Francesca Lipari (2019): Getting the Best of Both Worlds? Developing Complementary Equation-Based and Agent-Based Models, *Computational Economics*, 53 (2): 763-782.

Heesen, Remco, Bright, Liam Kofi, and Andrew Zucker (2016): Vindicating methodological triangulation, *Synthese*, 35 (1): 75-115.

Kapeller, Jakob (2019): Pluralism in Economics – Epistemological rationales and pedagogical implementation, in: *Advancing Pluralism in Teaching Economics*, Wolfram Elsner Samuel Decker and Svenja Flechtner (Eds.), New York: Routledge, 55–77.

Matthewson, John, and Michael Weisberg (2008): The Structure of Tradeoffs in Model Building. *Synthese,* 170 (1): 169–190.

Weisberg, Michael (2006): Forty Years of 'the Strategy': Levins on Model Building and Idealization, *Biology & Philosophy* 21 (5): 623–45.

Weisberg, Michael (2007): Who Is a Modeler?, *The British Journal for the Philosophy of Science* 58 (2): 207–233.