Validation of Agent-Based Models in Economics and Finance

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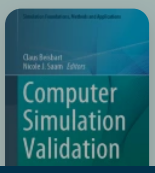

Computer Simulation Validation

and (iii) parameter space exploration. Finally, we discuss open issues in the field of ABM validation and estimation. In particular, we argue that more research efforts should be devoted toward advancing hypothesis testing in ABM, with specific emphasis on model stationarity and ergodicity.

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1. The validation process might also take different perspectives. In particular, as reported by Burton and Obel (1995), the model's assumptions and abstractions have to be judged accordingly with the model's purpose. In this paper, we mostly focus on validation of policy-oriented, descriptive agent-based economic and financial models.

2. However, also other viable strategies are available: see, for example, the calibration approach proposed by Werker and Brenner (2004); Brenner and Werker (2007) and the history friendly models developed by Malerba et al. (1999).

3. In that there is a major departure with respect to neoclassical models, where the (representative) agent has axiomatic preferences and maximizes some

the robustness with respect to initial conditions.

8. In agent- based modeling, some of the standard validity aspects that are relevant in many fields of numerical simulations are not an issue; for example, systems are always represented in discrete time and, hence, discretization errors are not possible. Further, low emphasis is usually posed on code verification.

9. See also Secchi and Seri (2017) on the issue of selecting the number of times a computational model should be run.

10. Level 0 models can be somehow accepted if their aim is merely exploratory rather than descriptive.

15. For robustness of the model, we here mean the stability of the results to small variations of the parameters. See also Lorscheid et al. (2012) and Thiele et al. (2014).

16. See also Chap. 12 by Marks in this volume.

17. For other interesting approaches on pattern-based validation see Barde (2016b) and Marks (2018).

18. VAR-LiNGAM stands for Vector Autoregressive Linear Non-Gaussian Acyclic Model.

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