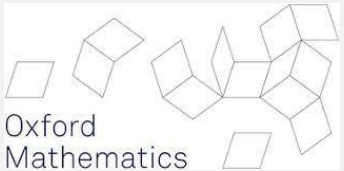
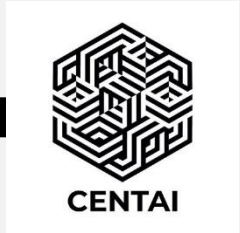
Who am I?

Complex systems



Bachelor, Master | PhD | Postdoc

2010-2015 | 2015-2019 | 2020-2022



Economics

My research: Complexity economics

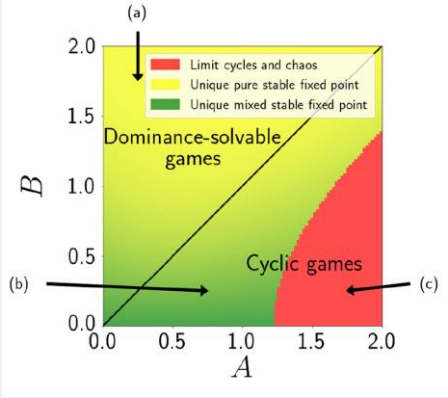
Theoretical foundations

PhD

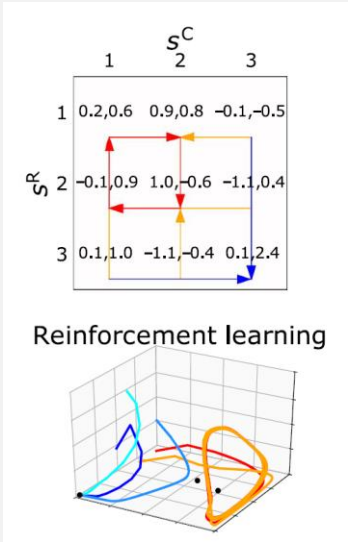
When is the equilibrium assumption reasonable?

- 2-player, 2-action games
- 2-player, N-action games
- N-player, N-action games
- Network games

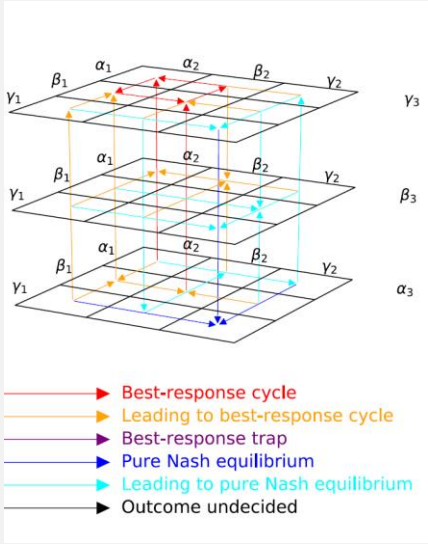
When is the equilibrium assumption reasonable?



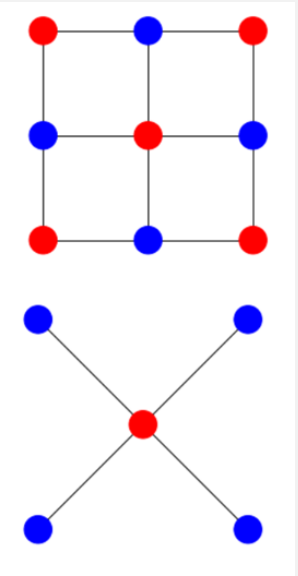
"Towards a taxonomy of learning dynamics in 2×2 games." *Games and Economic Behavior* 132 (2022): 1-21.



"Best reply structure and equilibrium convergence in generic games." *Science advances* 5.2 (2019): eaat1328.



"Best-response dynamics, playing sequences, and convergence to equilibrium in random games. *International Journal of Game Theory* (2023).



"Best-response and dynamics in network games." *In preparation* (2023)

My research: Complexity economics

Theoretical foundations

Usefulness in practice

Applications
- Economic impact of Covid on UK economy
- Epidemic-economic model of New York
- Synchronization of business cycles
- Housing markets and climate risk

PhD

When is the equilibrium assumption reasonable?

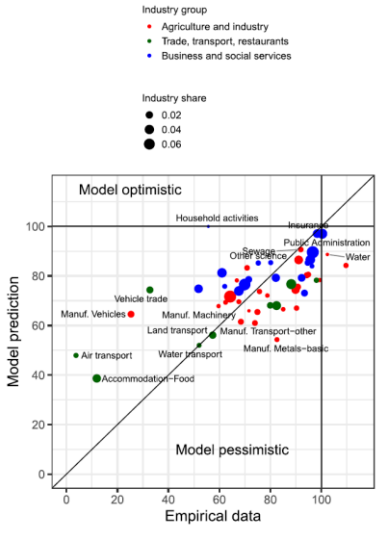
- 2-player, 2-action games
- 2-player, N-action games
- N-player, N-action games
- Network games

Postdoctoral fellowship

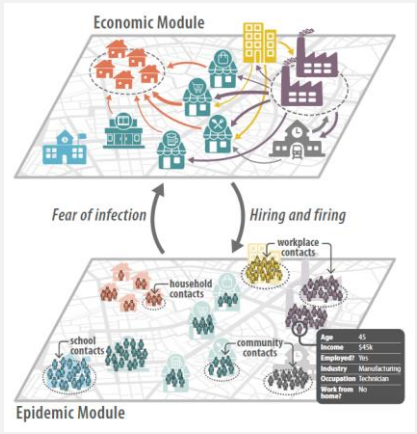
Data-driven Agent-Based Models

Methods
- Learning latent variables
- Sensitivity analysis
- Properties of ABMs from model code
- ABM causal networks
- Statistical model checking of ABMs

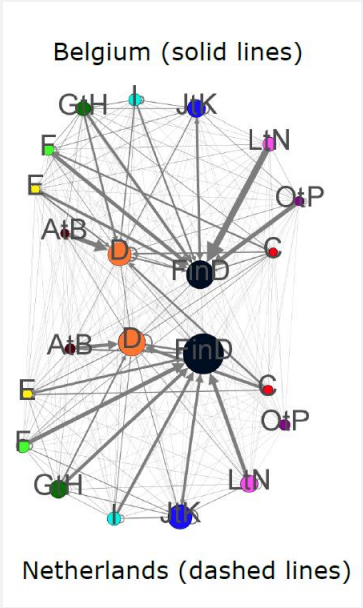
Data-driven economic ABMs: applications



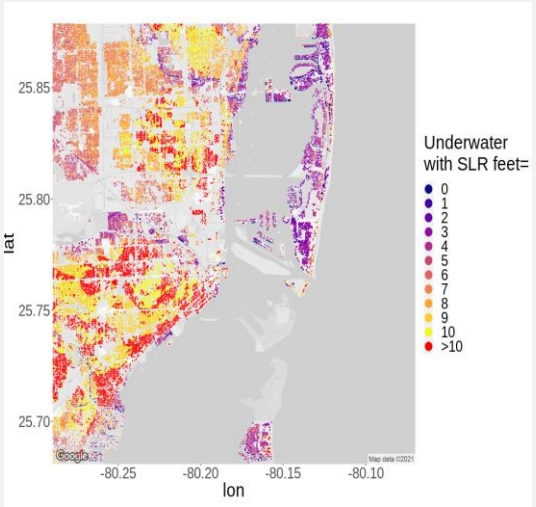
"Forecasting the propagation of pandemic shocks with a dynamic input-output model." *Journal of Economic Dynamics and Control* (2022): 104527.



"The unequal effects of the health-economy tradeoff during the COVID-19 pandemic." *Under review (2023)*

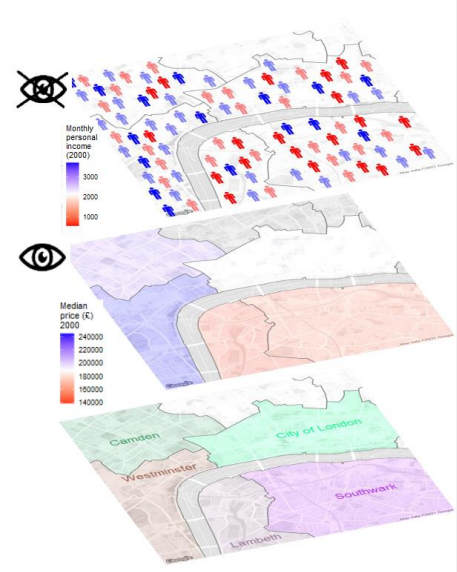


"Synchronization of endogenous business cycles." *Under review* (2023)

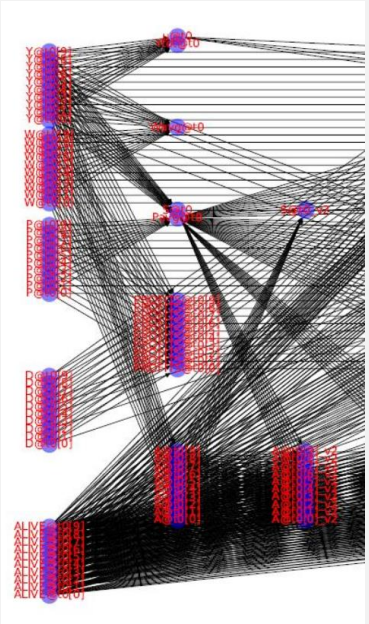


"Climate change attitudes in a data-driven Agent-Based Model of the housing market." *In preparation (2023).*

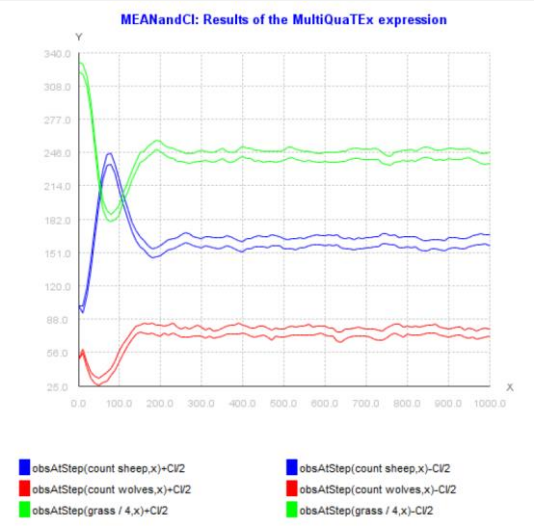
Data-driven economic ABMs: methods



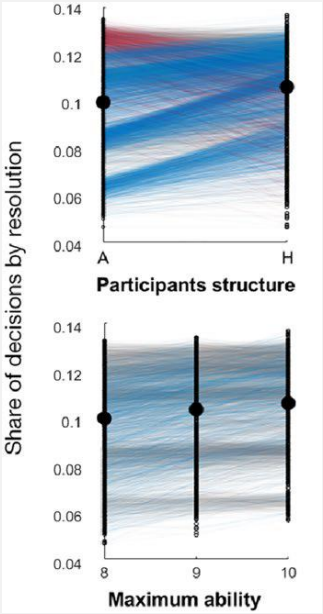
"On learning agent-based models from data." *arXiv preprint arXiv:2205.05052* (2022)



“ABM properties and causal networks directly from model code." *In preparation*



“Statistical model checking: MultiVesta meets Netlogo." *In preparation*



"Sensitivity analysis of agent-based models: a new protocol." *Computational and Mathematical Organization Theory* 28.1 (2022): 52-94.

Course: complexity economics

- 48 hours, 6 CFU
- Introduction (2h). What is economics? What is complexity economics?
- Microeconomics (24h). Microeconomic behavior, partial equilibrium, Nash equilibrium, heavy-tailed distributions, financial markets, financial networks
- Macroeconomics (22h). National accounting, growth, business cycles, input-output, macroeconomic agent-based models

In general: introduce economic concepts without any prior knowledge, introduce traditional treatment, then complex systems approach

Techniques: dynamical systems, networks, stochastic processes, statistical mechanics

What do complexity economists do?

- Economist with the quantitative skills of a physicist! Very attractive for private sector
- Jobs in institutions such as central banks, OECD, EU, IMF, World Bank etc.
- Jobs in academia: exciting research field, but still a niche. One needs to be careful and strategic.