

Thesis title

Motivation:

- Agent based modeling is closer tied to the real world than common economic equations.
- With today's extensive compute power technology, it is computationally viable to simulate a large enough amounts of agents with adequately complex interactions to derive macroeconomic results from microeconomic theory and experimentation.

Background:

<https://www.sciencedirect.com/science/article/pii/S0014292122001891>

- Defining some external environment is necessary for a realistic ABM because any system unless all variables are completely unaffected by an external environment, cannot be represented and simulated in its entirety unless the whole universe is simulated.

Method:

1. Define agents from common sense (as of now initially)
2. Define interactions from common sense (as of now initially)
3. Define external environment from the OECD database or similar
4. Define initial conditions from the OECD database or similar
5. Simulate many times (monte carlo) with random variables being reset each time
6. Compare with AR(0) and other status quo economic predictors
7. Readjust agent parameters, agent interactions and environment from result of comparison using reinforcement learning

Two types of interactions; monetary and relational

At the root of most economic decisions both at an individual and a collective scale, the agents relation to each other plays an important role. (One does not buy a car purely from an objective performance vs need vs cost basis. A person's history, impression and overall feeling (humor) also plays a large part in decision making). These relational interactions interact affect monetary ones and vice versa (monetary affects relational). Therefore both of these will be considered when defining and simulating agents.

In this thesis relational variables will be marked with an R at the end to separate them from monetary.

Laws as well? idk TBD

Some relations have many layers. These will therefore be represented as vectors and symbolised with a "V" at the end.

Agents definitions:

- Government
 - Inputs: taxes, internalSentimentRV, internationalSentimentRV
 - Inner structure: peopleTBD
 - Outputs: laws and regulationsL, subsidies, tax returns, rhetoricR
- Central bank
 - Inputs
 - Inner structure
 - Outputs
- Bank
 - Inputs
 - Inner structure

- Outputs
- Company
 - Inputs
 - Inner structure
 - Outputs
- Household
 - Inputs
 - Inner structure
 - Outputs