

Forecasting in a complex environment: machine learning firms expectations in a SFC Agent based simulation model

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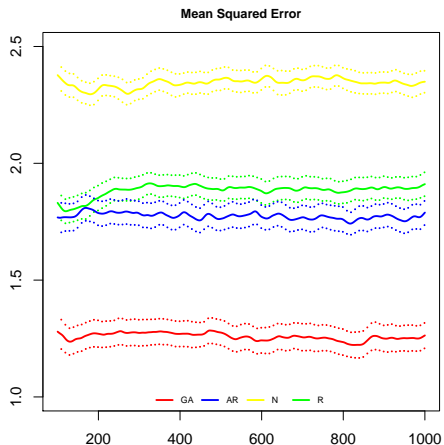
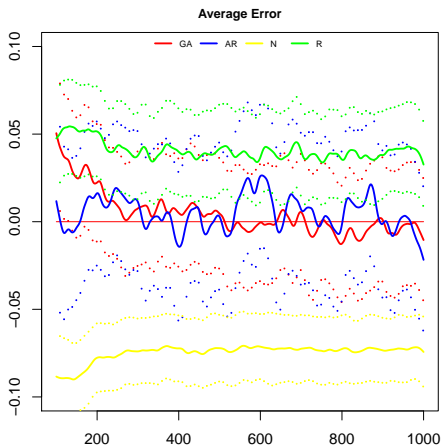
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Forecasting in an ABM

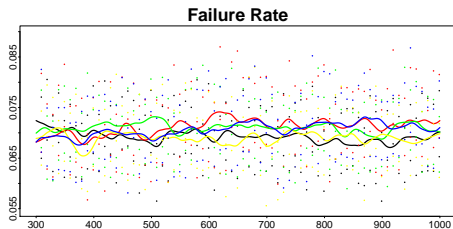
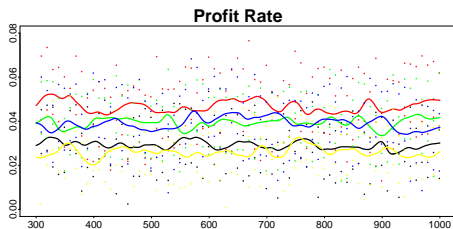
- Economic agents decisions depend on their expectations .
- Several attempts of introducing expectations in an ABM (Dosi et al., 2017)
- Aim: modeling firm sales expectations expectations that are not biased and with a certain degree of accuracy
- Thus, adopting machine learning techniques as GA (genetic algorithm) and AR (Autoregressive model)
- Testing the macro and micro effects of these expectations

Expectation accuracy



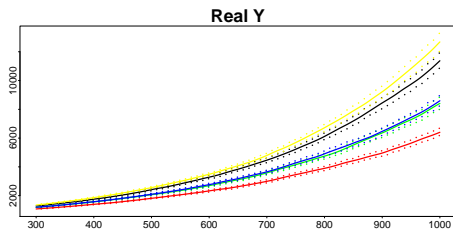
GA (in red) and AV (in blue) are not biased, Ga presents a better performance

Effect on firm performance



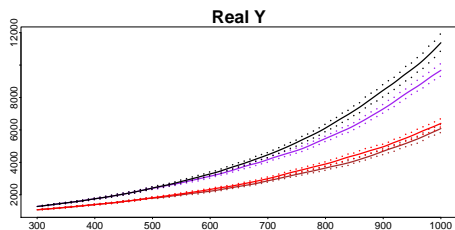
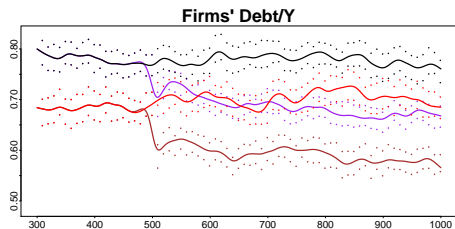
GA (in red) has higher profit than the baseline scenario (in black)

Macro Effects



GA (in red) has lower income growth than the baseline scenario (in black)

Credit restriction



GA (in red and after brown) shows lower income decline than the baseline scenario (in black and after purple)

Thank you

References

- Dosi, G, Napoletano, M, Roventini, A, Stiglitz, J.E, Treibich, T, 2017. Rational Heuristics? Expectations and Behaviors in Evolving Economies with Heterogeneous Interacting Agents. LEM Papers Series 2017/31, Laboratory of Economics and Management (LEM), Sant'Anna School of Advanced Studies, Pisa, Italy.