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Essays on Nonlinear Evolutionary Game Dynamics

Marius Ochea

Evolutionary game theory has been viewed as an evolutionary “repair” of rational actor game theory in the hope that a population of boundedly rational players may attain convergence to classic “rational” solutions, such as the Nash Equilibrium, via some learning or evolutionary process.

In this thesis the model of boundedly rational players is a perturbed version of the best-reply choice, the so-called Logit rule.

With the strategic context varying from models of cyclical competition (Rock-Paper-Scissors), through industrial organization (Cournot) and to collective-action choice (Iterated Prisoner’s Dilemma), we show that the Logit evolutionary selection among boundedly rational strategies does not necessarily guarantee convergence to equilibrium and a richer dynamical behavior - e.g. cycles, chaos - may be the rule rather than the exception.

Marius-Ionut Ochea (1977) holds a M.A. in Economics from Central European University, Budapest, Hungary (2004) and a M.Phil. in Economics from Tinbergen Institute, Amsterdam, the Netherlands (2006). In 2006 he joined CeNDEF (Center for Nonlinear Dynamics in Economics and Finance) at the University of Amsterdam for his Ph.D. study. As of September 2009 he is working as a post-doc researcher at CentER, Tilburg University. Main research interests include: evolutionary game dynamics, norms evolution and emergence of cooperative behavior.