

Coalitional stochastic stability in games, networks and markets

Ryoji Sawa*

Center for Cultural Research and Studies, University of Aizu

January 18, 2013

Abstract This paper examines a dynamic process of unilateral and joint deviations of agents and the resulting stochastic evolution of social conventions in a class of interactions that includes normal form games, network formation games, and simple exchange economies. Over time agents unilaterally and jointly revise their strategies based on the improvements that the new strategy profile offers them. In addition to the optimization process, there are persistent random shocks on agents utility that potentially lead to switching to suboptimal strategies. Under a logit specification of choice probabilities, we characterize the set of states that will be observed in the long-run as noise vanishes. We apply these results to examples including certain potential games and coalitional bargaining games.

Keywords: Stochastic stability; Coalitions; Logit-response dynamics; Bargaining.

JEL Classification Numbers: C72, C73, C78.

* Address: Tsuruga, Ikki-machi, Aizu-Wakamatsu City, Fukushima 965-8580, Japan., telephone: +81-242-37-2500, e-mail: rsawa@u-aizu.ac.jp. The author is grateful to William Sandholm, Marzena Rostek and Marek Weretka for their advice and suggestions. The author also thanks Pierpaolo Battigalli, George Mailath, Jonathan Newton, Satoru Takahashi, Yuichi Yamamoto, H. Peyton Young, Dai Zusai, and seminar participants at Econometric Society North American Summer Meeting, Temple University, University of Aizu, University of Kansas and University of Wisconsin-Madison for their comments and suggestions.