

Finite-order equilibrium

Willemien Kets

Northwestern University

April 25, 2013

ABSTRACT

The standard framework for analyzing games with incomplete information models players as if they have an infinite depth of reasoning, which is often not consistent with experimental evidence. We therefore use a generalization of the type spaces of Harsanyi (1967-1968) which allows players to have a finite depth of reasoning to model players' behavior. Specifically, we model a player's depth of reasoning by the set of events she can reason about. This gives a richer framework than the one studied in the existing literature, in which a player's depth of reasoning is represented by a single number. This richness allows us to extend the concept of Bayesian equilibrium to the present setting. We show that while every Bayesian equilibrium in a finite-depth type space defines a Bayesian equilibrium in any Harsanyi type space that extends the finite-depth space in a natural way, the converse does not hold. This means that in general, Harsanyi type spaces cannot be used to model the equilibrium behavior of players with a finite depth of reasoning.