

Fudenberg, Drew; Levine, David K.

Self-confirming equilibrium. (English) Zbl 0796.90072
Econometrica 61, No. 3, 523-545 (1993).

The authors introduce a new solution concept for games in extensive form – the self-confirming equilibrium – which captures the features of the outcomes of a plausible learning process. In an earlier study, *D. Fudenberg* and *D. M. Kreps* [‘A theory of learning, experimentation and equilibrium in games’, mimeo, Stanford (1988)] had pointed out that a natural learning process would not necessarily converge to a Nash equilibrium outcome.

After having formally defined self-confirming equilibria, the authors investigate their properties and analyze their relationships with Nash equilibria and other standard game-theoretic solution concepts. In a self-confirming equilibrium, each player’s strategy is a best response to his beliefs about the play of his opponents, and each player’s beliefs are correct along the equilibrium path of play. A first reason that a self-confirming equilibrium may not be the outcome of a Nash equilibrium is that the beliefs of two players about the play of a third one need not be consistent. This motivates the introduction of consistent self-confirming equilibria. But even these may not be Nash, because a player’s uncertainty about his opponents’ strategies can be correlated. Furthermore, consistent self-confirming equilibrium allows each strategy that a player assigns positive probability to be a best response to different beliefs. This last feature implies that a consistent self-confirming equilibrium may fail to be Nash even in two-person games. However, the authors prove that the two properties above (i.e., off-path correlation and heterogeneous beliefs) encompass all reasons why consistent self-confirming equilibria may not be Nash equilibria. In particular, in two-player games, every self-confirming equilibrium with unitary beliefs is Nash.

The authors also establish that every outcome of a consistent self-confirming equilibrium can be achieved through an extensive form correlated equilibrium.

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