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EVOLUTIONARY GAMES AND THE REPLICATOR DYNAMICS

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Evolutionary Games and the Replicator Dynamics

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Abstract: This Element introduces the replicator dynamics for symmetric and asymmetric games where the strategy sets are metric spaces. Under this hypothesis the replicator dynamics evolves in a Banach space of finite signed measures. The authors provide a general framework to study the stability of the replicator dynamics for evolutionary games in this Banach space. This allows them to establish a relation between Nash equilibria and the stability of the replicator for normal-form games applicable to oligopoly models, theory of international trade, public good models, the tragedy of commons, and the war of attrition game among others. They also provide conditions to approximate the replicator dynamics on a space of measures by means of a finite-dimensional dynamical system and a sequence of measure-valued Markov processes.

Keywords: games with continuous strategy spaces, asymmetric evolutionary games, evolutionary games, population games, replicator dynamics

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