

Repeated Games with Forgetful Players

By

Selcuk Ozyurt

New York University
Department of Economics

We present a model which investigates the behavior of forgetful players in infinitely repeated games. We assume that each player may forget the history of the play with some fixed probability. Our modeling specifications make a clear distinction between absentminded and forgetful players: Players may forget what they played in previous periods; their strategies, whether they have already forgotten, but they always remember what stage they are in. Strategies that have been used to prove various folk theorems in the literature are no longer equilibrium strategies in this context, because they depend upon the assumption that players have perfect recall; each player can perfectly recall what action had been chosen previously. We first consider a case where forgetfulness is simultaneous: If a player forgets, so do the rest. In this relatively simple case, we are able to show that it is possible to achieve various Folk theorems. We also consider a case where forgetfulness is independent i.e., the state of the memory of each player, forget or recall, is no longer common knowledge between players. In this case, we do not allow players to communicate with each other by any means. The lack of common knowledge introduces an extra challenge to the structure of the game. We focus on *Conditionally Belief-Free* strategies to recapture the recursive structure in the sense of Abreu, Pearce and Stacchetti (1986, 1990). By utilizing their method, we investigate the structure of the payoff set in which each payoff vector can be supported as a sequential equilibrium. We also show that this family of strategies is large enough so that we can prove Folk theorems in independent forgetfulness case as well.