

The Splitting Game

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We introduce the dependent splitting game, a zero-sum stochastic game in which the players jointly control a martingale in some finite-dimensional simplex, and consider a general evaluation of the stage payoffs. The existence of the value is established for any fixed evaluation. We proceed then to both an asymptotic and a uniform approach. First, we prove the convergence of the value functions as the weights of each stage tend to 0 to the unique solution of the Mertens-Zamir system of equations. Second, we prove the existence of the uniform value for the infinitely repeated splitting game and exhibit a couple of 0-optimal stationary strategies for which, in addition, the stage payoff and the state remains constant after at most one stage. As an application of our previous results, we establish the convergence of the values for repeated games with incomplete information on both sides, in the dependent case, as the weights of each stage tend to zero.