The value of a draw

By Casilda Lasso de la Vega and Oscar Volij

Keywords: stochastic games, zero-sum games

Abstract

We analyze matches where each component game has three outcomes. Chess matches for the world championship are an example of these games. In these matches players play several chess games and the winner of the match is the first player to achieve some specified score. One feature of chess is that it has three possible outcomes: a win, a draw and a loss.

We show that a value of the draw $v_k$ can be assigned to each component game $k$, so that in equilibrium players play the component games as if they were isolated zero sum games where a win is worth 1, a loss is worth 0 and a draw is worth $v_k$. In general, the value of the draw depends on the whole structure of the match. In mega-symmetric matches, however, the value of the draw in each component game depends only on the component game.