

Game theorists devise way to even the odds in soccer shootouts

March 11 2016



Credit: AI-generated image ([disclaimer](#))

Penalty shootouts in soccer favor the team kicking first—an advantage that is widely recognized by both statisticians and coaches. In order to level the playing field in these tie-breaking sessions, a pair of game theorists have come up with a procedure that removes the built-in edge of kicking first.

The "Catch-Up Rule," devised by New York University's Steven Brams and Maastricht University's Mehmet Ismail, calls for the following: if, in a given round, one team scores a goal and the other does not, the team that failed to score gets to kick first in the following round.

If both teams either scored or did not on a round, the team that kicked first on that round must kick second on the next round. The Catch-Up Rule is strategy-proof in the sense that a team will have no incentive, if it kicks second on a round, to deliberately miss so that it can kick first on the next round.

Currently, a [coin toss](#) determines which teams kicks first on all five penalty kicks, giving a significant advantage—determined by chance—to the team that leads off.

Previous research has shown that, in major tournaments between 1970 and 2013, the team that kicked first won the penalty shootout more than 60 percent of the time. Teams recognize this as well. When coaches and players were asked in a survey about whether they would choose to go first or second if they won the coin toss, more than 90 percent said they would go first, according to a 2010 study in the American Economic Review.

The paper also considers other sports, weighing whether advantages are gained under existing rules and showing how some competitions could benefit from certain rule changes. The sports they analyze include tennis, volleyball, and badminton, among others.

The current tie-breaker in tennis, Brams and Ismail show, is fair—it gives equally skilled players the same chance of winning—whereas the rules in badminton advantage the player who serves first and the rules in volleyball advantage the team that receives first.

"In almost all competitive sports, the rules allow for some element of chance, such as who gets to move first," the authors observe.

In their work, they show how certain rule changes, such as the Catch-Up Rule, can minimize the advantage that chance confers.

More information: The paper, "Making the Rules of Sports Fairer," may be downloaded here: [politics.as.nyu.edu/docs/IO/25 ... Sports Rules JPE.pdf](https://politics.as.nyu.edu/docs/IO/25...Sports_Rules_JPE.pdf)

Provided by New York University

Citation: Game theorists devise way to even the odds in soccer shootouts (2016, March 11)
retrieved 6 May 2024 from
<https://phys.org/news/2016-03-game-theorists-odds-soccer-shootouts.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.