

Goal-l-l-l-l!

A BOSTON COLLEGE ECONOMIST PROPOSES IMPROVEMENTS TO THE RULES OF SOCCER



Professor M. Utku Ünver has used economic theory to facilitate kidney transplants, expedite foster-child adoption, and assign pupils to public schools. Can he (and two Australian colleagues) now help soccer? The following text is drawn and adapted from a 2015 working paper titled “Designing Fair Tiebreak Mechanisms: The Case of FIFA Penalty Shootouts,” written by Ünver with economists Nejat Anbarci and Ching-Jen Sun. The authors call their proposal the Alternating-Order Behind-First Mechanism.

Problem: The shootout used to determine the winner in a tied soccer game is perceived to be “unfair” by soccer professionals; and there is empirical evidence to support their view.

Currently, when the score is tied after 90 minutes of regulation and 30 minutes of extra time, each team attempts five shots on goal from the penalty mark, taking turns after each kick in an order derived from a referee’s coin toss; that is, the team that wins the toss gets to decide who goes first for the duration of the five rounds. In 2010, a pair of economists examined 269 shootouts and reported in the *American Economic Review* that “with just one exception, the winner of the coin toss chose to kick first.” Often this choice paid off. First-kicking teams went on to win with a 60.5 percent probability.

Question: What does fairness mean when an unbiased coin toss determines the first-kicking team and thus the probable winner?

It should mean two things. First, when two teams are balanced in terms of their players’ abilities, each team should be expected to win with 50 percent probability. And, second, when one team has better kickers, that team should have a higher probability of winning. These two statements lead directly to the age-old Aristotelian justice principle: Equals should to be treated equally and unequals unequally.

Solution: In the shootout, it doesn't matter which team kicks first in the first round. A coin toss will do. Two teams of equal power have an equal chance of winning when they enter that round tied. Thereafter, when the score is tied after any round, the team kicking last in that round should kick first in the next.

And when the score is not tied anymore? Enter the "behind-first" scheme, in which the team that falls behind kicks first in the next round. There are several rationales for this. One is a forward-thinking argument: A player knows that if he misses and the other team scores in a round, his teammate, who will kick first in the next round, will feel intense pressure that could decrease his accuracy. So, in the current round the player puts pressure on himself to kick a solid shot. The goal precision of all players increases. Another rationale is that the behind-first sequence gives the most number of players a chance to kick, since the shootout ends early if one team develops an insurmountable lead.

What about if one team is just better than the other at kicking penalties? Its players will still have the incentive to exert their best effort. On average, the better team will win the shootout.

After five rounds, still-tied teams enter a sudden-death shootout, taking turns going first, round by round, until a team emerges from a round victorious.

Precedents: As it turns out, the behind-first property is effectively at work in pétanque, a game involving balls and a wooden target. Pétanque was invented in ancient times by the Greeks, later modified by the Romans, and is still played in parts of the world.

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- [M. Utku Ünver's faculty page](#)
- [Read the complete working paper: "Designing Fair Tiebreak Mechanisms: The Case of FIFA Penalty Shootouts"](#)

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