

Scoring probability versus shot clock

Figure 1a: These graphs are obtained by analyzing two datasets, deriving from the play-by-play records of all the matches played during two competitions: the Italian "Serie A2" Championship 2015/2016 (that constitutes the second-tier of the Italian league pyramid, just below the first division "Serie A", and is the highest Italian non-professional competition level), and the Olympic Basketball Tournament "Rio 2016". The datasets are obtained by extracting, from play-by-play data, all the attempted shots, described according to all the information that can be extrapolated from such data (e.g. the player, the time, the shot clock, the score, ...). This Figure investigates the relationship between the scoring probability (i.e. the probability to score a basket when a shot is attempted) and the shot clock (i.e. the time of the shot clock at each attempted shot), separately for 2-point and 3-point shots. The coloured areas (blue for "Serie A2" and green for "Rio 2016") range from the 5th to the 95th percentile of the bootstrap estimates of the scoring probability in correspondence to each value of shot clock. The horizontal red dashed lines denote the 2-point (left panel) and 3-point (right panel) field goal percentages and the grey lines represent the estimated density function of shots for each value of shot clock, whose measure is reported on the right-hand side vertical axis. The shot clock exhibit a significant effect on the scoring probability, that appreciably decreases as the buzzer sound is closer. The shots attempted in the first seconds of the possession have the highest probability in the case of 2-point shots, as they usually occur in case of fast break. Instead, for 3-point shots, early shots are less successful, as they usually occur when trying an end-of-quarter buzzer beater (often "from downtown", in their jargon). Anyway, the density functions (grey lines) show that the main part of the attempted shots tend to occur in the last 12 seconds. No remarkable differences between the two datasets "Serie A2" and "Rio 2016" is detected from this point of view (in spite of the very different professional level), except for a more pronounced effect on the probability of early 3-point shots (right-bottom panel) and a reduced tendency to shot in the very last seconds (grey lines) emerging from "Rio 2016" data.

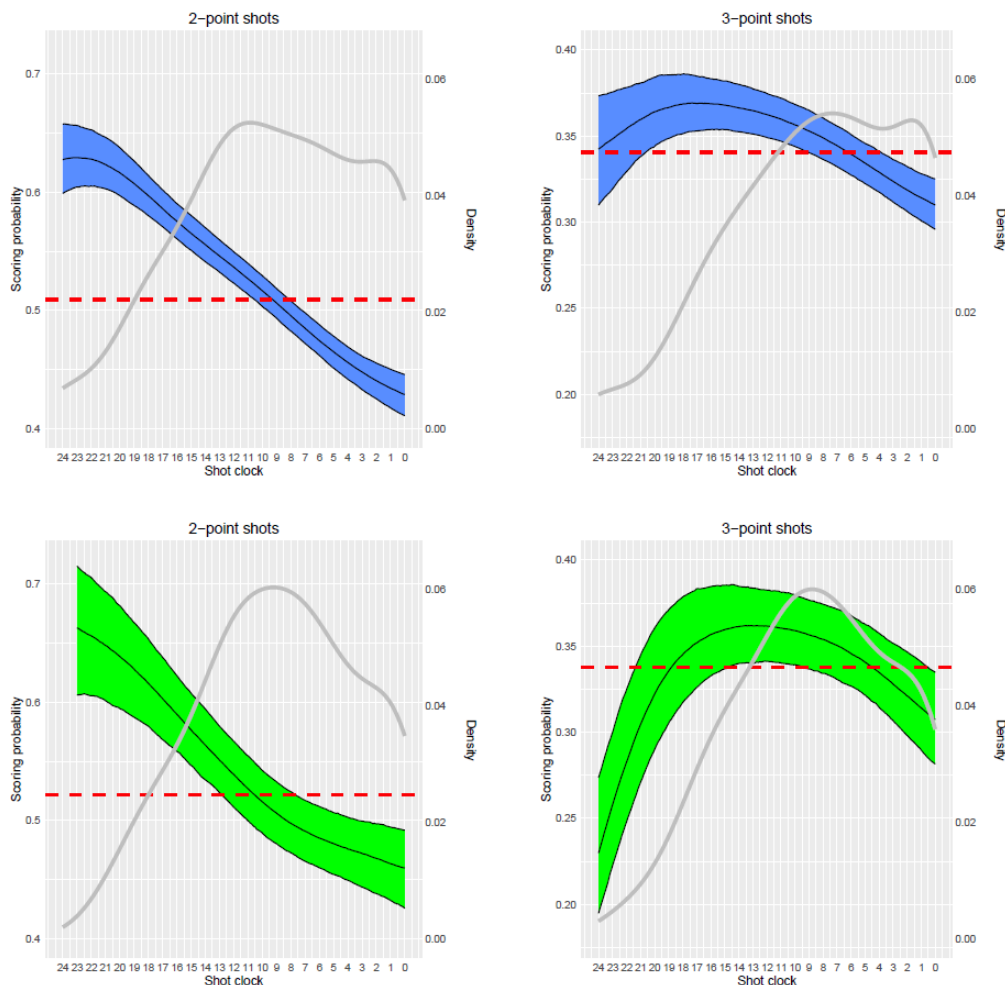


Figure 1b: These graph focuses on the "Rio 2016" dataset and on 3-point shots. It shows how the scoring probability is affected by shot clock for all the teams in the Olympic Tournament (red line, this is the same relationship described in Figure 1, bottom right panel) and for the two team ranked 1st and 2nd (USA and Serbia, respectively).

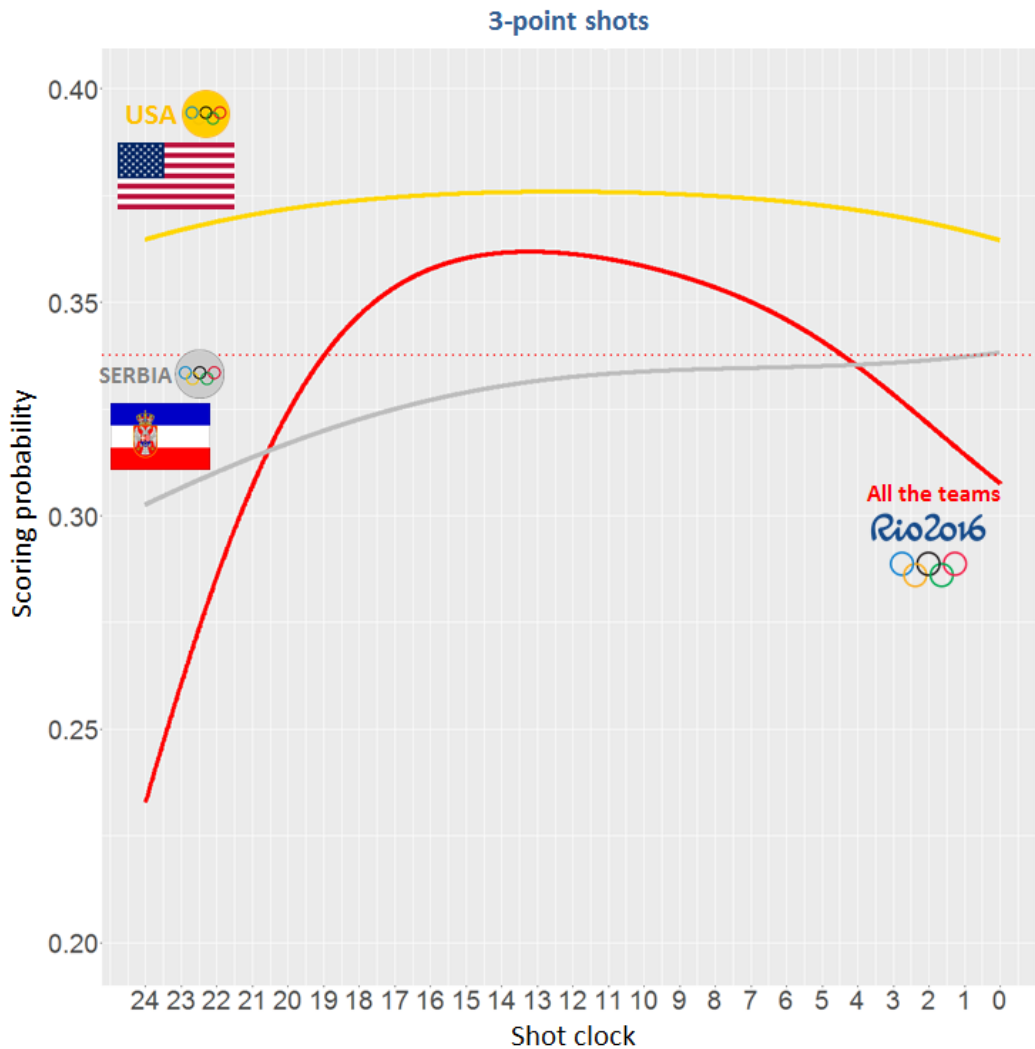


Figure 1c: These graphs again focus on the "Rio 2016" dataset and on 3-point shots. They show the density of shots at each value of shot clock for all the teams in the Olympic Tournament (left panel) and for the two team ranked 1st and 2nd (middle and right panel, respectively).

