Shortening the NBA Game: A Look at the Effects on Competitive Balance

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Competitive balance has long been a concern of sports leagues (and a topic of research for sport economists) based on the unique economic interdependence of teams. This situation creates the dynamic where teams are aiming to maximize their respective revenues, typically through maximizing team wins, while at the same time desiring a sound level of competitive balance throughout the league in order to maximize league-wide fan interest and subsequent revenues. The recognition of the importance of competitive balance and its relationship to revenues both for teams and the league has been noted by Fort & Quirk (1995), Palomino & Rigotti (2000), Zimbalist (2003), and Bowman, Lambrinos, & Ashman (2012), amongst others.

The National Basketball Association (NBA) should be the most concerned of major US professional sports leagues with maintaining/improving competitive balance because the relative standard deviation of regular season winning percentage in basketball is persistently higher than Major League Baseball, the National Football League, and the National Hockey League (Rockerbie 2014). With the clear financial incentives to increase competitive balance from a league standpoint, talks have started between owners, league executives, players, and coaches about shortening season length, game length, or both. During the 2011 lockout season, the 66 game schedule provided an example of the potential effects of a shortened season. However, “cutting the number of games wouldn’t inject as much unpredictability as a minutes reduction” (Lowe 2014). A minutes reduction would allow for more randomness, as the better team would have less time to allow their superior talent to win the game.

The NBA has shown an open mind towards shortening game length, experimenting with a 44-minute game in a 2014 preseason competition between the Brooklyn Nets and Boston Celtics. Though the transition to 44-minute games is not imminent, this experiment warrants additional analysis to determine the season long effects on competitive balance. This study utilizes a simulation of the NBA season at three different game lengths (48, 44, and 40 minutes) to analyze the effects that a shorter game would have on competitive balance.

In order to simulate NBA game results, Net Points Per Possession (NPPP) is used to measure team talent level. NPPP is the average net result of one offensive and defensive possession for an NBA team. NPPP is an effective measure for the study because it allows for game simulations based on the number of possession in a game, which facilitates simulations using different game lengths. Additionally, NPPP has proven to be a good indicator of winning percentage over the 12 seasons of NBA data collected (2002-2014), with a 0.957 correlation between NPPP and winning percentage.

The simulation has three key parameters: pace, mean difference in NPPP, and standard deviation of NPPP. The pace determines the number of possessions per game, and is based on team data from the 2002-2003 season through the 2013-2014 season from basketball-reference.com, to be consistent with the NPPP data collected. This data was used to construct a normal distribution of pace, and a random draw from this distribution is used to determine the number of possessions for each simulated game. The mean difference in NPPP is calculated for each game simulation as the NPPP of the home team minus the NPPP of the away team. To calculate the standard deviation of NPPP on a possession basis, play-by-play data from the entire 2009-2010 season was used, with the assumption that the standard deviation of points scored on a possession does not fluctuate a significant amount season-to-season.

The simulated games were comprised of individual possessions, with the result of each possession equal to a random draw from a normal distribution with a mean of game net NPPP and constant standard deviation of NPPP. The pace parameter determined the number of possessions used in each individual simulated game, with the individual possession results summed to determine the final outcome of each game. Each game length (48 minutes, 44
minutes, 40 minutes) was simulated for 1,000 NBA seasons, with each season consisting of 30 teams and 1,230 total games.

Based on the simulations, there was significantly more competitive balance in the NBA seasons with shortened games. The 5 teams with the lowest win totals for the 48-minute game season saw their win totals increase by an average of 0.68 wins per season in the 44-minute game simulation, while every team with a negative NPPP saw an average increase in wins of 0.35 in the 44-minute game simulation. The top five teams in terms of wins during the 48-minute simulation saw their average win total decrease by 0.62 wins per season in the 44-minute game simulation, and every team with a positive NPPP had an average decrease in wins of 0.35 per season.

The 5 teams with the lowest win totals for the 48-minute game season saw their win totals increase by an average of 1.12 wins per season in the 40-minute game simulation, while every team with a negative NPPP saw an average increase in wins of 0.58 in the 40-minute game simulation. The top five teams in terms of wins during the 48-minute simulation saw their average win total decrease by 1.04 wins per season in the 40-minute game simulation, and every team with a positive NPPP had an average decrease in wins of 0.58 per season.

Additionally, the standard deviation of regular season win percentage across the league decreased from 0.127 for a 48-minute game to 0.123 and 0.119 for a 44-minute and 40-minute game respectively. These results provide evidence that shortening NBA games would be a practical and straightforward method for improving competitive balance in the league. Similar results could also likely be found for shortening game length in the other professional sport leagues.