Time Series Analysis of NCAA Basketball Competitive Balance: Institutional Changes, Integration, and the NBA's Policy Impacts

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Introduction

The study of competitive balance and uncertainty of outcome in North American professional sport dates back to Rottenberg (1956), with subsequent extensions to international leagues such as the English Premier League (Szymanski & Kesenne, 2004; Lee & Fort, 2012; Alavy et al., 2010) and Asian baseball and basketball leagues (Lee, 2004; Lee, 2006; Zheng & Fort, forthcoming). However, competitive balance research has been limited with respect to collegiate sport. Only a few studies have addressed balance in “big time” college football (Depken & Wilson, 2006; Bennet & Fizel, 1995), with little if any focused on college basketball.

In this work, we extend the competitive balance literature to National Collegiate Athletics Association (NCAA) Division I Basketball, and make clear a distinction unique to NCAA competition in the North American context with respect to inter-conference and intra-conference competitive balance. We first address the long term competitive balance within conferences for game level, championship (playoff) level, and consecutive season level (“dynasties”; Lee & Fort, 2008), and evaluate structural changes near policy changes, antitrust legal battles, and realignment as they relate to intra-conference balance.

Because the structure of the NCAA provides unique characteristics not present in professional North American leagues—conference-level broadcasting contracts and the relatively fluid ability of schools to move in and out of conferences—we also analyze inter-conference competitive balance. In this portion of the analysis, we address the concentration of team quality across conferences and the impacts of institutional changes on balance across time. Of particular interest is the inclusion of African American players among schools in southern conferences and its effects on conference strengths.

We consider other institutional changes such as the split of the NCAA into multiple divisions and the “one-and-done” rule implemented by the National Basketball Association and the impact on the available talent and its distribution across college basketball. Additionally, the expansion of the NCAA tournament, conference and national television coverage, conference tournaments, travel for games, and inter-conference competition have increased significantly over the time of analysis. We therefore examine each of these events across conferences.

Data

Our data come from Basketball Reference (2013) and include all NCAA Division I basketball teams since the inception of the national tournament (1938/39-2011/12). We gathered overall records, regular season within-conference records, and out-of-conference records for each team in each conference. Our data also include the Associated Press preseason ranking, highest achieved ranking, and final ranking for each team, as well as conference and national tournament success for each team and each conference at the yearly level. Finally, our data include overall points per game and points allowed per game for each team in each year.

Methods

We use the Breakpoint Method first described in Fort and Lee (2006), allowing for a full time series treatment of competitive balance in NCAA Division I basketball. Past work has employed this method for the four major North American leagues (Fort & Lee, 2006; Lee & Fort, 2007; Lee & Fort, 2012; Mills & Fort, 2013) finding relevant competitive balance structural changes near large economic events in U.S. history, the presence of rivals, and around changes in league business structure. We expand this approach to college basketball, evaluating macro-level historical events as well as policy changes and their respective impact on competitive balance within conferences. We address
multiple realizations of balance, including game-level balance, the propensity for dynasties, championship concentration, and a ratio of score differential for each conference.

We secondly evaluate the convergence and divergence of conference-level competitive balance metrics using clustering techniques. This portion of the analysis is ongoing.

Preliminary Results

Preliminary intra-conference analysis of the five most prominent conferences in NCAA Division I (the Big East is excluded due to its shorter history) indicates only the Pac-12 and Big Ten experience large structural shifts in dynasty-related balance over their history. While game-level balance slowly changed across time in conferences, there were no sudden changes in any of these five time series.

In the Pac-12, the disbandment of the previous Pacific Coast Conference (PCC), and beginning of the tenure and subsequent success of legendary coach John Wooden are associated with two large changes in this metric. Wooden was one of the most prominent proponents of racial integration in college basketball. The Big Ten experienced a change concurrent with the exit of the University of Chicago and subsequent entrance of Michigan State University, and later after the nearly full integration of African American players into southern schools. We expand upon these findings with analysis of less prominent conferences.

Finally, our preliminary inter-conference analysis reveals important changes in the distribution of wins across conferences. This portion of the analysis is ongoing, and initial results indicate strong divergence of the most prominent conferences in NCAA with that of the lower tier conferences. These changes are concurrent with both integration—particularly in the south—and the split of the NCAA into a second, and later, third division.

Implications

Our results have the potential to inform policy makers with respect to NCAA (and NBA) policies that have influenced conference realignment, player compensation, labor agreements, recruiting policies and association management decisions. We note that the differential impacts on player talent movement across levels within Division I have implications for the institutional development of the NCAA in the future, particularly with the recent prominence of pay-for-play debates.