

Competitive Balance in a Modern League Structure

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Competitive balance is one of the most central concepts in the literature of sports economics. The uncertainty of outcome hypothesis (Rottenberg, 1956) suggests that a minimum level of competitive balance is a necessary requirement for the financial viability of professional team sports. However, after more than a half century of research competitive balance is still not uniquely defined, neither theoretically nor empirically. This is due in part to the complexity of the concept with at least three fundamental dimensions relevant for analysing the general level of competitive balance in a league. First, the Quirk and Fort's (1992) competitive balance ratio is related to the distribution of sporting outcome among all teams in a league. A second dimension is related to the stability (or instability) of performance from season to season as, for example, measured by the Spearman's correlation coefficient (see, for example, Daly and Moore, 1981). A high level of performance persistence reflects weaker level of competitive balance. The third dimension is related to prize concentration. Quirk and Fort (1992) use Lorenz curve, and Gini coefficients to measure the distribution of champions over time. A higher level of competitive balance should be reflected in greater dispersion of championship winners. Treating competitive balance as a multi dimensional concept is widely accepted in the literature, for example, Vrooman (1996), Maxcy (2002), and Humphreys (2002), where the latter also develop a two-dimensional measure (see also Eckard, 2001).

This study aims to show that even in a simple league context, competitive balance is complex. The three fundamental dimensions are required to give an appropriate picture of a league's level of competitive balance. But it is important to recognise that these measures of competitive balance are based on a simple league context. However, in the current multi-prize league structures these measures are unlikely to be able to capture the relationship between the level of teams' competitiveness and fan interest. The match significance measure developed in the demand study for Scottish soccer by Jennett (1984) shows an early appreciation of the possible demand consequences of multi-prize structures (i.e. championship and relegation).

The theoretical framework will be built around a simple league system, where deviations that appear in current leagues will be analysed. A simple league system can be defined as a closed league, where teams either win or lose, the match schedule is based on a full round-robin set of matches where all teams play the same number of games home and away, and the only prize to win is the championship. In addition is the structure of the league is unitary, meaning that the league outcome is based on results that are equally weighted from all matches. This simple league system might look alike some of the older structure in some leagues, but current league systems in different sports all around the World deviate significantly from this structure.

Four relevant deviations from the simple league structure will be analysed, both with regards to the influence on traditionally competitive balance measures, and the way it might affect team incentives and fan interest. First, results are not only based on wins and losses. In a number of team sports draw matches are relevant. For example, in the top division in Italian football more than 30 percent of the matches after the Second World War are ties. In addition, the score systems might reward draw matches differently. In European football all leagues now use the 3-1-0 system rewarding a win three times of a draw, while the traditional system weighted a draw as a half win (2-1-0 system). Secondly, the match schedule might be based on other structures than full round-robin as, for example, in the unbalanced schedule of the NFL. Thirdly, many tournaments including more than stage with regular season play determining post-season qualification. In the North American major leagues this is done by post-seasonal play-offs. In European football, the international club tournaments arranged by the UEFA (Union of European Football Association) are mainly based on performance in regular season (but can also be based on performance in "side-tournaments" such as the English FA Cup). Fourthly, many leagues are not closed. For example, the European team sports tradition is based on open, merit hierarchy leagues, where teams are relegated and promoted between divisions at different levels based on sporting performance (Szymanski, 2003).

The motivations behind complex tournament structures, involving multiple prizes are mainly based on maximising fan interest by increasing the number of significant matches. This significance might not be only related to which team will be the winner of the league, but also for which teams to qualify for playoffs. Therefore the general fan interest can easier be kept, even if only a few teams are realistically able to win the championship. These relationships can thus be a significant determinant for explaining why for example attendance in the English top division have increased while competitive balance, has been weakened, measured both by the "traditional" measures and a developed measure for relegation frequency of newly promoted teams in this study. These results are consistent Michie and Oughton (2005), using other measures.

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Given that fan interest not only depends on the general level of competitive balance, *ceteris paribus*, but on the overall intensity of competition related to the prizes of a league, this study suggest that there is a need to develop measures that reflect the teams' contention for different prizes during the season.

Illustrations for some of the measures of competitive balance will be made for the North American major leagues and the "big 5" leagues in European football (i.e. England, France, Italy, Spain, and Germany) for the last 40 years. The Quirk and Fort competitive balance ratio indicates that the "big 5" leagues in European football are better balanced than the major leagues, with exception of the two last decades for the NFL. It is more difficult to find general patterns when using the Spearman's rank correlation coefficient. Herfindahl index is used to measure the distribution of championships. Generally, the distribution is better in the major leagues, and the difference is larger in the second half of the sample period.

Two alternative prize concentration measures are also included in the analyses. For the major leagues, an unadjusted Herfindahl index is used for analysing the distribution of playoff contenders. There are two major findings in the results. First, the increased number of teams as well as the number of playoff places in the major leagues during the sample period, is reflected in reduced concentration ratios. Second, MLB has for each of the four ten-season periods the highest playoff concentration of teams, while the other major leagues have approximately the same level of concentrations. In European football, ambiguous results can be found in the relative relegation rate for newly promoted teams in the top division among the "big 5" leagues. While it has increased in England, the results are opposite in Germany and Italy. The results in France and Spain vary between the different ten-season periods. In the last decade the English and the Spanish leagues have the highest ratios, indicating greater differences in sporting quality between the two highest level divisions than for the other three leagues.