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## THE IMPACT OF THE HORIZONTAL DISTRIBUTION OF MEDIA RIGHTS REVENUES IN SPORTS LEAGUES ON COMPETITIVE BALANCE

**Abstract:** There are two possibilities for selling media rights in sports: either each team sells media rights individually, or the league sells them in a package. In the latter case, teams act as a cartel. This cartel is justified if the individual sale of media rights would make spectators worse off. The negative effect of the cartel is reflected in the higher price of media rights. The positive effect is that small teams can obtain higher revenues than if they sell media rights individually. Thus, the collective sale of media rights enables maintaining a certain level of competitive balance (equal strength of teams) in the league. The European Commission allows the collective sale of media rights at auction if the league sells at least two media rights packages to different media houses for a certain number of seasons. Revenues from selling media rights are divided vertically between the monop-

ly sports organisation and teams and horizontally between the teams themselves. The horizontal distribution of revenue can be such that teams share revenues equally, based on the historical results or based on the number of fans. These criteria can be combined in the allocation of revenue. In this paper, we will analyse sports leagues with different criteria for revenue distribution and determine how they affect competitive balance. The level of competitive balance is measured using the adjusted (unbiased) normalised HHI index. In the leading football leagues, there is no clear relationship between the method of revenue distribution and competitive balance.

**KEY WORDS:** SPORTS LEAGUES, MEDIA RIGHTS, COMPETITIVE BALANCE

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## 1. INTRODUCTION

In this paper, we will study the collective sale of media rights in sports leagues, and at this point, it is useful to define different types of sports leagues. In closed leagues that exist on the North American continent, there is no possibility for promotion from a lower ranked league or relegation to a lower ranked league. New teams can only enter the competition if they buy a franchise from a team wanting to leave the competition. In open leagues that exist in Europe, there is a hierarchical relationship between them. Teams from a lower ranked league can be promoted to a higher ranked league, and also, teams from a higher ranked league can be relegated to a lower ranked league. A team in a closed league has the monopoly position in a certain city with rare exceptions, while there might be several teams in the same city in an open league. In the theoretical sports economics literature, teams are assumed to maximise profit in closed leagues, and teams in open leagues maximise the probability of winning subject to the zero-profit constraint (in reality, many teams in open leagues have negative profit).

We will study the collective sale of media rights by a league, which could be identified as collusive behaviour by competition authorities. Cartels are almost always *per se* prohibited with rare exceptions. This exception applies to the collective sale of media rights. Namely, the regulatory criterion in sports markets is the level of competitive balance that measures whether teams are of equal strength. The alternative for the collective sale of media rights is an individual sale, but under this arrangement, small teams can sell media rights for a small amount of money. Hence, the collective sale of media rights enables small teams to obtain higher revenue after the redistribution, and this arrangement can improve competitive balance compared to individual sales.

The distribution of revenue from the collective sale of media rights can be vertical (between the league and teams) and horizontal between teams. Horizontal distribution is based on different criteria, such as equal share, the results, or the number of fans. We will study how these different criteria affect competitive balance in the top 5 football leagues.

## 2. METHODOLOGY

This paper relies on the standard cost-benefit analysis conducted in competition policy to determine whether a certain practice should be allowed or prohibited. The regulatory criterion for the assessment of the welfare effects of certain practices in sports economics is the level of competitive balance.

Thus, one of the most important methodological issues in sports economics is measuring the level of competitive balance. There are several measures in the literature, but we have chosen the Herfindahl-Hirschman Index (HHI). The value of this index is sensitive to the number of teams in the league, and it needs to be normalised. Even this normalised HHI is sensitive to the length of the season (number of teams multiplied by the number of times teams play against each other in a season), and we have used adjusted normalised HHI for cross-league comparisons. Although in the text we also discuss competitive balance in other sports competitions, from a methodological point of view, there are some obstacles to constructing HHI for these competitions. Hence, we have limited our comparisons of competitive balance only to the top 5 football leagues. The main finding of our paper is that there is no clear relationship between the criteria for horizontal revenue distribution in the top 5 football leagues and the level of competitive balance. Namely, Bundesliga does not have the criterion of equal sharing, and it has a higher level of average competitive balance over the last 16 seasons than 3 other leagues that share 40-50% of media revenue based on the equal sharing criterion.

### **3. COLLECTIVE SALE OF MEDIA RIGHTS**

Competition policy in sports incorporates the idea that there should be some agreements in sports competitions between direct competitors. Otherwise, the competition might not exist at all. If one team is considerably stronger, and all others are very weak, the weak teams might go bankrupt, and only the strong team could survive, undermining the existence of competition. Competition commissions monitor the rules imposed by the governing structure of the league, such as team budgets, player transfer rules and so on. In standard markets, competition commissions use consumers' surplus or total welfare as the regulatory criteria, and in sports, the regulatory criterion is the level of competitive balance. Competitive balance is perfect if all teams have an equal chance to win in any match. The reason why competitive balance is important is twofold. First, if competitive balance is quite low, this could threaten the league's existence. Second, the audience is interested in competitive balance and uncertainty of matches (except for ultra-fans who want to see their team always winning), which increases their demand for sports events and indirectly total consumer surplus and welfare in this market. For that reason, we will see that some practices in sports are exempted as restrictive horizontal agreements<sup>1</sup>.

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<sup>1</sup> In the US, for example, the baseball league-MLB, is exempted from the application of the Sherman Act (Farzin, 2015).

Teams participating in a sports competition should agree on the rules of the competition, and on some occasions, the rules are imposed externally by the governing structure of the league. These agreements regarding the rules of the game, such as the number of players that could be substituted in a football match or how many teams will be promoted from the lower ranked competition and relegated to lower ranked competition, are not considered by competition commissions. Commissions are interested in economic agreements between teams, such as the decision to sell media rights collectively or individually.

As we have already said, each team can individually sell the media rights for broadcasting its matches. The other possibility is the practice that is in competition policy called bundling and tying, which in this case means that individual media rights are sold in a package by the league. This behaviour of teams reassembles on collusive agreements. As it is well known, collusive agreements are *per se* prohibited with rare exceptions. Suppose this kind of agreement between teams should be exempted as a violation of competition rules. In that case, it must make the spectators of sports competitions better off than in the case of individual sale of media rights. For some sports competitions that have only a league format, individual sales of media rights are feasible since there are fans who are only interested in the matches of the team they support. But there are also other spectators who are interested in the competition as a whole, and individual sale of media rights would make these spectators worse off. For some other competitions with an eliminatory stage or competitions where all teams in the championship compete simultaneously in one event (such as Tour de France), the individual sale of media rights is not feasible because the spectators are interested in the entire course of the competition. In 2003, the European Commission allowed the collective sale of media rights if the benefits of such sales outweigh the harmful effects. We will discuss this decision of the European Commission in more detail later.

The collective sale of media rights has its advantages and disadvantages. The main positive effect of the collective sale of media rights is that it enables a higher level of competitive balance since small teams can obtain more financial resources under this arrangement than when they sell media rights individually. Since the willingness of the media to pay for the matches of small teams is low, it is questionable whether teams at the bottom of the league could be able to sell individually broadcasting rights at all. With the collective sale of media rights (but also depending on the way these revenues are shared), small teams could collect higher revenue. Therefore, the collective sale of media rights fulfils the regulatory criterion of competition policy in sports markets, that is, to preserve or even increase competitive balance in a league.

In general, theoretical papers in sports economics assume that spectators do not have identical preferences for competitive balance. Namely, one share of fans prefers competitive balance, while the other share, called ultra-fans, prefers competitive imbalance. This assumption is supported by empirical papers that have determined that TV spectators prefer competitive balance, while ultra-fans at stadiums prefer competitive imbalance<sup>2</sup>. Therefore, for TV spectators collective sale of media rights is justified if it increases competitive balance compared to the individual sale of media rights. Since TV spectators are the dominant type of audience compared to ultra-fans, collective sale of media rights increases total consumers' surplus. It is a well-known fact that transaction costs accompany the bargaining process. These costs are larger for media houses (in terms of time and number of staff needed) if they should negotiate with individual teams rather than with the league. The third positive effect is in competitions with the eliminatory stage, such as the Champions League, NBA, FIFA World Cup, etc. In that case, buying media rights in advance from individual teams is a lottery due to the uncertainty related to the fact that it is not known which team will reach which stage of the competition. The fourth positive effect is that the collective sale of media rights creates the league brand, and this might increase both spectators' willingness to pay to media to watch sports competition, and consequently increase the amount media are willing to pay to the league.

The negative effect of the collective sale of broadcasting rights is reflected in the higher price for media rights that partly stems from the larger bargaining power of the league compared to individual teams. However, as we have already explained, part of the increase in the price of broadcasting rights is related to higher spectators' willingness to pay. The part of the price increase of broadcasting rights related to the larger bargaining power of the league might induce negative effects for spectators depending on the type of media ownership. Public service media are forced to increase the number of advertisements during broadcasts of sports events to cover the higher price of media rights. In addition, both private media houses and public service media have less resources available for other sports competitions or for other non-sport types of programs, which affects viewers who are not interested in sports competitions. As we will see soon, there is a trade-off in the distribution of media rights revenues. Equal distribution improves competitive balance, while distribution based on results provides incentives to teams to be more competitive and invest in

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<sup>2</sup> Some of these empirical papers are Buraimo and Simmons (2009) for Primera, Pavlowski and Anders (2012) for Bundesliga and Cox (2018) for Premier league.

talents. In this context, if the revenue sharing rule is not based on historical results, teams will have distorted incentives to invest in talented players.

As we have already said, the European Commission has exempted the collective sale of broadcasting rights as a restrictive horizontal agreement, provided that the benefits for spectators outweigh the negative effects. Collective sale of media rights is allowed under the following conditions. First, the league must offer at least two packages of media rights that must be sold to different media houses. Second, the sale of media rights should be organised through an auction mechanism. Third, the media rights are sold for a certain number of seasons, and after the expiration of the rights, the media rights should be re-auctioned. Fourth, if the media rights package does not include a live broadcast of a certain match of a team, that team retains the rights to sell the media rights individually.

UEFA auctioned media rights in 2017 for the following 3 seasons (2018/19-2020/21) for the Champions League, Europa League and Super Cup. Sky Sport was the highest bidder in the auction for the rights to broadcast to German spectators. In order to watch these events on Sky Sport channels, each spectator should pay a subscription. Sky Sport offered another possibility to watch these events on its online channels for online subscribers. Since European Commission allows the collective sale of media rights if there are at least two media houses in a country that can broadcast the same sports event, in order to comply with this decision, Sky Sport has resold part of its broadcasting rights for the Europa League matches to online subscription channel DAZN. Sky Sport resold part of its broadcasting rights to the RTL financed by advertising.

The contemporary trend is to offer viewers more flexibility and a wider choice of devices (phone, laptop or tablet) on which they can follow sports events. Traditionally it was TV, but owing to technological development and high Internet speed, more and more sports content is available online with a subscription. Online broadcasting of sports competitions has brought the possibility to follow these events on different devices even when a viewer is not at home. In addition to media companies offering sports content online exclusively, TV channels also offer sports content online to compete with the former broadcasters. In Germany, an increasing number of viewers follow sports competitions online. Budzinski *et al.* (2019) have determined that the largest share of viewers on online channels are in the age group (20-29), 22.87%, and the age group (30-39), 11.22%. The older the age group, the lower the share of online spectators.

Some empirical research in the English sports market aimed to determine how the sale of at least two packages of media rights affects viewers. These studies reveal that the price per game for viewers is higher in the case when media rights are awarded to competing media than it would be the case if a single media company owned the rights. The reason may be that bidders pay too much for media rights at auctions. These are, in fact, auctions with interdependent values, and each bidder bids on its signal (the estimate of the value of media rights). In this case, the bidder with the highest bid may suffer from the winner's curse. In addition, competing media companies hold complementary media rights to viewers, and they know that viewers want to watch all complementary sports events. This complementarity imposes the need for viewers interested in complementary sports events to pay a subscription to more than one media company, which induces higher transaction costs for these viewers. An additional implicit cost for viewers interested in complementary sports events is that there is no joint program of complementary sports content. The remedy for this problem is the availability of an integral program guide for sports content on traditional and online channels, and this would reduce these implicit costs.

#### **4. VERTICAL AND HORIZONTAL DISTRIBUTION OF REVENUE FROM THE SALE OF MEDIA RIGHTS**

As we have already said, competing teams cannot act independently of each other, as they must cooperate in terms of game rules, championship game schedules, etc. This observation has motivated Neal (1964) to claim that sports competitions often represent a natural monopoly, while Sloan (1971) argues that sports competitions represent a cartel. The logic behind the argument that sports competitions represent a natural monopoly stem from the fact that there should be one national competition to determine the best team in that country or one world championship to determine the best team in the world. European basketball competition was fragmented on Uleb Euroleague, and FIBA organised Superleague, but this has reduced the interest in general for a basketball competition since spectators want to have one competition where the strongest teams compete. The more striking example of fragmentation is in boxing, where there are four rival competitions: WBA (World Boxing Association), WBC (World Boxing Council), IBF (International Boxing Federation) and WBO (World Boxing Organization). This fragmentation of boxing competitions has also reduced the public's interest in this sport. Moreover, for the best boxing athletes, it is quite difficult if they want to reunite the titles from different

competitions. The previous discussion implies that sports competition should be a natural monopoly.

The revenues from the collective sale of media rights are divided in two ways: vertical division between media rights owners and teams, and horizontal division between the teams. In terms of the terminology of markets with vertical relations where we have upstream and downstream firms, in sports with a league as a natural monopoly, the sports organisation is an upstream monopoly, and teams are downstream competitors (Budzinski and Szymanski, 2015).

There are three possibilities concerning the vertical relationship between sports organisations and teams. The first possibility is that the sports association (consisting of teams that play in the league and teams from lower-ranked leagues) owns the media rights of the league (model A). Among the top football leagues, only French Ligue 1 has this form. Examples in other sports are NASCAR and NFL. The second possibility is that only teams from a certain league form a sports association that owns media rights (model B). The other four main football leagues have this form: Primera, Premier League, Bundesliga and Serie A. The third possibility is that an external organisation that is not formed by teams owns the media rights (model C). Only Formula 1 is organised under this form. Due to the anti-competitive concerns, FIA was forced to sell the media rights for 313.7 million USD to a consortium of private companies (FOM) in 2010 for the next 100 years. The amount for which media rights were sold is too low, considering that FOM's annual revenue from Formula 1 exceeds the amount paid for media rights ownership, according to Budzinski and Müller-Kock (2018).



**Table 1.** Vertical distribution of revenue

Competition	The share of media revenue for media rights owner	The share of media revenue for teams	Other participants in media rights revenue sharing
Bundesliga	0%	80%	20% Second division
Premier League	0%	100%	
Serie A	0%	100%	
Ligue 1	0%	100%	
Primera	3%	93%	3.5% for teams relegated from the league 0.5% for Second division and for First women league
NFL	0%	100%	
Formula 1	35%	65%	
NASCAR	10%	25%	65% for track owners

**Source:** Budzinski and Müller-Kock (2018)

Table 1 shows the vertical distribution of revenue between media rights owners and teams in the top 5 European football leagues, NFL, and 2 car competitions: Formula 1 and NASCAR. From Table 1, we can observe that 3 of the top 5 football leagues allocate all the media revenue to teams (Premier League, Serie A and French Ligue 1). At the same time, the Bundesliga distributes 80% of the revenue to teams and 20% to teams in the second league. Primera distributes 93% of revenue to teams (the league retains 3%, 3.5% is directed to teams relegated from the league and 0.5% to the First women league). Among other sports competitions from Table 1, NASCAR keeps 10% of media revenue as its profit. It is also interesting to observe that 65% of media rights revenue is directed to track owners, and only 25% is shared between teams. The external owner of the media rights of Formula 1 keeps 35% of the total revenue as its profit, which is probably the highest share in all sports competitions.

The horizontal distribution of revenue from the sale of media rights concerns the distribution between teams based on different criteria or the combination of these criteria. The first criterion is equal distribution when teams receive an equal share of

the revenue from media rights. This criterion aims to maintain or improve competitive balance. The second criterion is the distribution of revenue based on the results from the last season or from several previous seasons. This option provides an incentive for teams to compete intensively and to invest in talents. There is also a possibility that teams overinvest in talents and that players are overvalued in the market. The third criterion, which is very rarely used, is the distribution of revenue with inverse dependence on the results, which aims to increase competitive balance. The fourth criterion is based on the number of fans. This option intends to compensate teams according to the contribution of their fans to the league's media revenue. These criteria can be combined, which is the case in main football leagues, such that part of the revenue is distributed evenly to teams, another part based on results, and the third part based on the number of fans. Table 2 shows the horizontal distribution of revenue between teams in different competitions.

Based on Table 2, we can conclude that 4 of 5 main football leagues equally distribute at least a part of the media revenue to teams. Only Bundesliga does not have equal distribution. Concerning other competitions, the NFL and NASCAR distribute the entire media revenue equally. On the other hand, Formula 1 does not have the principle of equal media revenue sharing. As we will see soon, the revenue distribution criteria in Formula 1 are strongly biased towards leading teams. There is no sports competition in Table 2 that uses the principle of revenue distribution with inverse dependence on the results. And it is really difficult to find a competition that uses this principle in reality.

**Table 2.** *Horizontal media revenue distribution*

Competition	Equal distribution	Distribution based on the results	Distribution based on the number of fans
Bundesliga	0%	100% based on the results in the last 5 seasons	0%
Premier League	50%	25% based on the results in the last season	25%
Serie A	40%	5% based on the results in the last season 15% based on the results in the last 5 seasons 10% historical results	25% number of fans 5% population of a team's city
Ligue 1	50%	30% based on the results in the last season	20%
Primera	50%	25% based on the results in the last 3 seasons	25%
NFL	100%	0%	0%
Formula 1	0%	50% based on the position in the constructors' championship in the last season	15% inherited payment
NASCAR	100%	0%	0%

**Source:** Budzinski and Müller-Kock (2018)

Among the top 5 football leagues, the Premier League and Ligue 1 distribute 25% and 30% of media revenue, respectively, based on the results from the last season. This conditional payment is based on very recent history. Primera distributes 25% of media revenue based on the results in the last 3 seasons, which is a longer history dependence, while the longest history dependence is in Bundesliga, which distributes

100% of media revenue depending on the results from the last 5 seasons. Serie A has the most complex payment that depends on results. Namely, 5% of media revenue is distributed according to the last season's results, 15% according to the results in the last 5 seasons, and 10% based on historical results in the entire existence of Serie A. Concerning other competitions, NFL and NASCAR do not have this criterion of distribution, while Formula 1 distributes 50% of media revenue according to the last season's standings in the constructor's championship. As for the last criterion of revenue distribution, the number of fans, Premier League and Primera distributes 25% of revenue based on the number of fans, and Ligue 1 20%. Here, again Serie A has the most complex contingent payment since 25% of media revenue is distributed based on the number of fans and 5% based on the city's population from which a team comes. This criterion implicitly assumes that in large cities, there is a larger number of spectators of football matches who are not official fans of a team. Bundesliga does not use the number of fans as the criterion of revenue distribution. For the other 3 competitions, NFL and NASCAR do not distribute media revenue according to the number of fans, and Formula 1 distributes 15% based on the so-called "inherited payment". Only teams with significant past results in Formula 1, are qualified for this payment since only these teams have a considerable number of fans. It is true that the number of Ferrari fans is the largest, followed by Mercedes, Red Bull, and McLaren, which also have a significant number of fans, while small teams, such as HAAS, have a very small number of fans.

**Table 3.** Criteria for „inherited payment“ in Formula 1 (from 1950 to 31st August 2022)

Team	Number of seasons	First season	Number of drivers championship titles	Number of constructors championship titles	Number of wins
Ferrari	73	1950	16	15	242
Red Bull Racing	18	2005	4	5	85
Mercedes	15	1954	8	9	124
McLaern	57	1966	8	12	183
Williams	46	1977	9	7	114

Source: Formula 1

According to Formula 1 rules, only Ferrari, Red Bull, Mercedes, McLaren and Williams receive this inherited payment. This historical payout depends on the

number of seasons in Formula 1, the number of wins in the drivers' championship, the number of wins in the constructors' championship and the total number of race wins. The criteria for "inherited payment" are shown in Table 4.

The horizontal distribution of media revenue in the 2014 season to teams in Formula 1 is given in Table 4, where it can be seen that Ferrari received the largest "inherited payment", followed by Red Bull, Mercedes, McLaren and Williams.

**Table 4.** Team media revenues in Formula 1 in 2014 season (in millions USD)

Position in constructors' championship	Team	„Inherited payment“	Distribution based on results	Total media revenue	The share of total revenue
1	Mercedes	34	92	126	14.27%
2	Red Bull Racing	74	82	156	17.67%
3	Williams	10	73	83	9.4%
4	Ferrari	97	67	164	18.56%
5	McLaren	34	63	97	10.99%
6	Force India		60	60	6.8%
7	STR		54	54	6.12%
8	Lotus		51	51	5.77%
9	Marussia		48	48	5.44%
10	Sauber		44	44	4.98%
Total		249	634	883	100%

Source: Budzinski and Müller-Kock (2018)

In 2014 Mercedes won the constructors championship, but it did not receive the largest share of media revenue because Ferrari, the fourth in the constructor's championship, had the largest "inherited payment". Also, Red Bull, the second in the constructor's championship, had a larger share of media revenue than Mercedes due to the larger inherited payment. The inherited payment that Ferrari received in that season (\$97 million) is larger than the revenue that Mercedes received by winning the constructors title in 2014 (\$92 million). This kind of distribution of media revenue, along with the fact that the criterion of equal sharing is not used, indicates that maintaining a certain level of competitive balance is not the ultimate objective of the collective sale of media rights.

Table 5 shows the distribution of revenue from the collective sale of broadcasting rights in the Premier League in the 2019/20 season.

**Table 5.** *Distribution of media rights revenue in the Premier League in the season 2019/20 (in million GBP)*

Position	Team	Equal distribution	Result	The number of fans	International TV rights	Comercial revenue	Total	Share
1	Liverpool	31.8	35.5	31	71.3	5	174.6	6.61%
2	Manch. C	31.8	33.8	27.9	69.9	5	168.4	6.38%
3	Manch. U	31.8	32	28.9	68.5	5	166.2	6.29%
4	Chelsea	31.8	30.2	26.8	67.1	5	160.9	6.09%
5	Leicester	31.8	28.4	16.5	65.7	5	147.4	5.89%
6	Tottenham	31.8	26.6	27.9	64.3	5	155.6	5.61%
7	Wolves	31.8	24.9	16.5	62.9	5	141.1	5.58%
8	Arsenal	31.8	23.1	26.8	61.5	5	148.2	5.34%
9	Sheffield U.	31.8	21.3	14.4	60.1	5	132.6	5.02%
10	Burnley	31.8	19.5	12.3	58.7	5	127.3	4.85%
11	Southampton	31.8	17.8	11.3	57.2	5	123.1	4.82%
12	Everton	31.8	16	19.6	55.8	5	128.2	4.77%
13	Newcastle	31.8	14.2	20.6	54.4	5	126	4.66%
14	Crystal P.	31.8	12.4	13.4	53	5	115.6	4.38%
15	Brighton	31.8	10.7	14.4	51.6	5	113.5	4.30%
16	West Ham	31.8	8.9	17.5	50.2	5	113.4	4.29%
17	Aston Villa	31.8	7.1	13.4	48.8	5	106.1	4.02%
18	Bornemouth	31.8	5.3	11.3	47.4	5	100.8	3.82%
19	Watford	31.8	3.6	11.3	46	5	97.7	3.70%
20	Norwich	31.8	1.8	11.3	44.6	5	94.5	3.58%
		636	373.1	373.1	1159	100	2641.2	100%

Source: Statista

We can observe that Liverpool obtained the highest media revenue share (6.61%) and Norwich 3.58%. Hence, the team that obtains the lowest share collected 54% of the media revenue attributed to the team with the largest share of media revenue, which indicates modest inequality in the distribution. The allocation based on results shows much greater variability, but there is the offsetting effect from the equal

distribution criterion. Furthermore, the dispersion of the distribution based on the number of fans and international broadcasting rights is lower than the dispersion of the distribution based on the results. In contrast, there is a much higher dispersion in the distribution of revenue from the collective sale of media rights in Formula 1. This inequality does not stem from the inequality in the revenue distribution based on results since the lowest ranked Sauber receives 47.8% of the revenue of the highest ranked Mercedes. But the inherited payment attributed to only 5 teams makes a significant difference. In the share of total revenue, the lowest ranked Sauber receives only 26.8% of the revenue of the highest ranked Ferrari. Hence, the inequality in the distribution of media revenue is at least 2 times larger in Formula 1 than in the Premier league.

There are different indices that could measure inequality in the distribution of revenue. In the present case, the Gini coefficient might be the best choice. HHI index is tailored to measure the level of concentration in a certain market, and it might not be the best choice to measure the inequality of distribution. However, due to the unavailability of the data for all sports competitions that we consider, we were not able to calculate the Gini coefficient for each league. Therefore, we will use the results of the calculation of the HHI index that was conducted by Budzinski and Müller-Kock (2018). The interpretation of the results is standard; when the value of the HHI index is lower, there is a more equal distribution of revenue.

**Table 6.** HHI index for media revenue distribution in different competitions in 2014

Competition	Formula 1	NFL	Bundesliga	Premijer I.	Serie A	Ligue 1	NASCAR
HHI	0.124	0.031	0.058	0.053	0.063	0.058	0.045

Source: Budzinski and Müller-Kock (2018)

In 2014, the lowest level of the HHI index was in the American competitions, NFL and NASCAR, which share the total media revenue equally. The highest value of the HHI index is in Formula 1, and the top European football leagues are between American competitions and Formula 1. All these football leagues have a similar level of HHI, with the Premier League having the lowest value of HHI and Serie A the highest.

Concerning Formula 1, the inequality in the distribution of media rights revenue indicates the collusion between the media rights owner and the leading teams. The media rights owner considers that due to the larger number of fans, these teams are more important for generating total media revenue than small teams. This collusion aims to guarantee the high share of total revenue that the owner of media rights obtains (35%) in the vertical distribution of media revenue and protects the rent of 5 teams that receive inherited payments. Hence, this collusion prevents small teams from becoming more competitive. The mechanism that enforces this cartel agreement is the Steering group that consists of 6 representatives delegated by the FIA, 6 representatives delegated by the owner of media rights (FOM), and one representative of each of the 5 privileged teams that receive inherited payments. In contrast, all other teams together have only one representative. The Steering group determines the rules of the competition that frequently change from one season to another<sup>3</sup>, and the privileged teams also have a high impact on the determination of the rules of the competition. The Steering group makes this cartel agreement stable by using the “carrot and stick” approach. “The carrot” is the inherited payment that the 5 teams receive, and the “stick” is designed to punish one of the privileged teams that would try to leave the cartel by changing the rules such that the cheating cartel member would be more hurt than other privileged teams.

For the aforementioned reasons, in October 2015, two small teams, Sauber and Force India filed a complaint to the European Commission against the FIA regarding the distribution of media revenues. These two teams were not a member of the cartel and had a high incentive to complain against the unfair rules. The European Commission started an investigation in February 2017. However, both teams withdrew their appeal in January 2018 after the media rights owner assured them it would adopt different revenue distribution criteria.

The FIA was previously the subject of an investigation by the European Commission, which concluded in 1999 that the FIA was abusing its position and blocking the establishment of a rival competition. Namely, the FIA has exclusive contracts with track owners preventing them from offering their tracks in other car competitions that could undermine Formula 1’s dominant position. This is a credible threat since many tracks would like to enter Formula 1 competition (particularly in the Middle East). Even the future of the famous Monaco Grand Prix is uncertain in Formula 1 from the 2023 season. Exclusive contracts are also concluded with teams, which are

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<sup>3</sup> Mastromarco and Runkel (2009) as well as Judde, Booth and Brooks (2013) have determined in theoretical and empirical research that FIA changes the rules from one season to another to improve competitive balance, but also to accomplish the safety standards.



prohibited from participating in competitions that the FIA considers competitive. Furthermore, the media that received the rights to broadcast Formula 1 races are also prohibited from broadcasting the races of a potential rival competitions. In some cases, exclusive contracts can be justified, such as the exclusive sale contract that prohibits a retailer from selling other manufacturers' products. If a manufacturer invests a lot in the marketing of these products, a producer of similar products could free ride on the marketing efforts of the first manufacturer by selling to the same retailer, which would reduce the level of advertising activity by both manufacturers. The exclusive contract is justified in this case since it would correct the previous market failure. Exclusive contracts in the case of Formula 1 could not be justified on the *rule of reason* basis, and the only purpose of these exclusive contracts is to prevent the entry of a rival competition. According to Budzinski (2012), there was an attempt to enter a rival competition-Grand Turismo (GT) series. Still, this entry was unsuccessful since FIA blocked the entry with exclusive contracts with the tracks, teams and drivers. It was evident that FIA's intention was to block the entry, since, after the entry failure, the FIA established the FIA GT Championship.

Because of the collusive practices and exclusive contracts that block entry, the European Commission has ordered that the FIA must transfer the media rights to an external owner. As we have already explained, the FIA did this by selling the media rights to the private consortium FOM for a period of 100 years. However, the anti-competitive practices remained unaffected after the transfer of media rights to an external entity, and this measure of the European Commission failed to achieve its objective.

In European football, UEFA has a dominant position in the upstream vertical relationship with downstream teams participating in its competitions. Similarly to FIA, UEFA determines the competition rules, sells broadcasting rights and determines the criteria for revenue distribution from the sale of media rights (Budzinski and Szimansky, 2015).

## **5. HHI AS A MEASURE OF COMPETITIVE BALANCE**

There are different measures of competitive balance in sports economics. The first possibility is to compare the actual number of league winners in a certain period with the theoretically maximal number of league winners. In closed leagues, it is straightforward to calculate the theoretically maximal number of league winners, while in open leagues, this procedure is more involved due to promotion and relegation. The second measure of competitive balance frequently used in sports

economics is the actual standard deviation of the share of gained points of teams in a league. The third measure is the relative standard deviation of the share of gained points of teams in a league that is obtained by dividing the actual standard deviation by the idealised standard deviation (that is calculated under the assumption that all teams have an equal chance to win every match). However, Owen (2012) and Owen and King (2015) show that the last two measures could be biased estimators of the true level of competitive balance. Therefore, we will use the fourth measure that is based on the well-known market concentration measure from the industrial organisation, HHI.

Suppose that a league has  $n$  teams, then HHI can be calculated in the following fashion:

$$\text{HHI} = \sum_{i=1}^n (\omega_i / \sum_{i=1}^n \omega_i)^2, \quad (1)$$

where  $\omega_i$  represents the number of points (or wins) in a season gained by team  $i$ , and  $\sum_{i=1}^n \omega_i$  is the total number of points (wins) won by all teams in a season. The HHI is by construction less than 1. In many leagues, there is a possibility that a match does not have a winner (draw) and that teams share points. In that case, HHI index calculated based on the number of points more accurately measures competitive balance than HHI calculated based on the number of wins in a season.

The lower the value of HHI, the higher the level of competitive balance. According to Owen *et al.* (2007), the lower bound of HHI is:

$$\text{HHI}_{lb} = 1/n. \quad (2)$$

The above equation implies that the lower bound of HHI is decreasing in the number of teams. Hence, the levels of competitive balance across the leagues with a different number of teams are not comparable based on this measure. For this kind of comparison, Depken (1999) proposes to measure the deviation of the HHI index (dHHI) from the lower bound:

$$\text{dHHI} = \text{HHI} - 1/n. \quad (3)$$

The upper bound of HHI also depends on the number of teams in a league:

$$\text{HHI}_{ub} = \frac{2(2n-1)}{3n(n-1)}. \quad (4)$$

The upper bound depends only on the number of teams,  $n$ , and is independent of the number of teams that meet in a season, which is denoted by  $k$ . In most European football leagues, times play against each other 2 times ( $k=2$ ), with rare exceptions such as the Scottish Premier League. As in the case of the lower bound, the upper bound is also decreasing in  $n$ :

$$\frac{dHHI_{ub}}{dn} = \frac{2}{3} \frac{2n(n-1) - (2n-1)^2}{n^2(n-1)^2} = -\frac{2}{3} \frac{n^2 + (n-1)^2}{n^2(n-1)^2} < 0. \quad (5)$$

The previous discussion implies that leagues with a larger number of teams have lower both the lower and the upper bound of HHI, which could lead to the wrong conclusion that there is a larger level of competitive balance in leagues with more teams. Thus, we cannot use the previously defined index to compare the level of competitive balance in leagues with different teams.

In order to make comparisons across leagues, it is necessary to normalise the index by using the previously defined upper and lower bounds. Normalised HHI is obtained by subtracting the lower bound from the index value and dividing this by the index range (the difference between the upper and lower bound). The range of values of the normalised HHI belongs to the interval  $[0,1]$ :

$$HHI^* = \frac{HHI - HHI_{lb}}{HHI_{ub} - HHI_{lb}} = \frac{dHHI}{dHHI_{ub}}. \quad (6)$$

This measure is independent of the number of teams in a season, but its drawback is that it depends on the length of the season. The length of the season depends, on its side, on the number of teams and the number of times teams play against each other (which we have denoted by  $k$ ). Hence, if we fix the number of teams in a league, the season is longer if teams play against each other 3 times, than when they meet 2 times in a season. Hence, McGee (2016) and Owen and Owen (2017) have defined the measure of the competitive balance that is independent of the season length:

$$adjHHI^* = \left[ \frac{k(n+1)HHI^* - 3}{k(n+1) - 3} \right]. \quad (7)$$

By using this measure, we can compare the level of competitive balance in leagues with different lengths of the season.

## 6. COMPETITIVE BALANCE IN THE TOP 5 EUROPEAN FOOTBALL LEAGUES

We have calculated the level of competitive balance in the top 5 European football leagues (Serie A, Primera, English Premier League-EPL, Ligue 1 and Bundesliga) by using the adjusted HHI\* for the share of points gained by each team in a season, with the share of points expressed as the decimal number. Hence, HHI\* index values are less than 1 and are between  $HHI_{lb}$  and  $HHI_{ub}$ . This measure of competitive balance is calculated for 16 seasons, from 2005/06 to 2020/21. Serie A, Primera, Premier League and Ligue 1 have 20 teams, while Bundesliga has 18 teams, which implies that normalisation of the HHI index is necessary to make cross-league comparisons.

*Table 7. Adjusted HHI\* based on the share of points in seasons 2005/06-2020/21*

<i>adj</i> HHI*	Premier	Serie A	Primera	Ligue 1	Bundesliga
2005/06	0.2635	0.2650	0.1462	0.1202	0.1807
2006/07	0.1801	0.2269	0.1086	0.0409	0.1034
2007/08	0.3230	0.1802	0.1264	0.0968	0.1300
2008/09	0.2626	0.1694	0.1326	0.1514	0.1804
2009/10	0.2924	0.1469	0.2749	0.1559	0.1444
2010/11	0.0944	0.1536	0.2005	0.0732	0.1065
2011/12	0.2312	0.1558	0.2076	0.1413	0.2052
2012/13	0.2542	0.2271	0.2368	0.1123	0.2393
2013/14	0.2889	0.3041	0.2574	0.1941	0.2830
2014/15	0.1939	0.2035	0.3699	0.1447	0.1498
2015/16	0.1711	0.2256	0.2545	0.1614	0.2190
2016/17	0.4109	0.3410	0.3508	0.2351	0.1576
2017/18	0.2998	0.3429	0.2552	0.2387	0.0909
2018/19	0.3520	0.2766	0.1256	0.1951	0.2755
2019/20	0.2426	0.2607	0.1928	0.1864	0.2363
2020/21	0.2066	0.3567	0.2556	0.2030	0.2050
Average	0.2542	0.2397	0.2185	0.1532	0.1817

**Source:** Internet pages of football leagues

In the last row Table 7, we have calculated the average values of the adjusted HHI\* index. According to the adjusted HHI\* average values, Ligue 1 has the highest level of competitive balance, followed by Bundesliga, Primera, Serie A and Premier League, respectively.

We can now compare the levels of competitive balance with the criteria for the horizontal distribution of media revenues to determine whether these criteria have an impact on the level of competitive balance in the top 5 European football leagues. Ligue 1 has the lowest average *adj* HHI\*, and 50% of revenues are divided equally (30% according to the results in the last 5 seasons). Still, the Bundesliga that has the second highest level of competitive balance, allocates 100% of media rights revenues according to the results in the last 5 seasons. This second position of the Bundesliga is puzzling. It shows that the relationship between criteria for horizontal distribution of media rights revenue and competitive balance is not straightforward in football leagues. If the equal division of media rights revenue improves competitive balance, Bundesliga should be placed at the last position according to the level of competitive balance.

Primera has the third highest level of competitive balance, and 50% of revenues are divided equally (25% according to the results in the last 3 seasons). Premier League has the fourth highest level of competitive balance, and 50% of revenues are divided equally (25% according to the results in the last season). Serie A has the lowest level of competitive balance, and 40% of revenues are divided equally (5% according to the results in the last season, 15% according to the results in the last 5 seasons, and 10% according to the historical results).

We cannot calculate adjusted HHI\* for NASCAR and Formula 1 since the value of  $k$  is unclear in this case. Namely, each team races against other teams in one race, and the adjusted HHI\* is constructed for league competitions such as football or basketball leagues. It is also quite tricky to calculate the adjusted HHI\* index for NFL due to the fact that teams from the same division meet more frequently in a season than teams from different divisions. In this case, it is also unclear how to define  $k$ . Should it be the average number of times teams play against each other? Even the calculation of normalised HHI (HHI\*) requires a different approach for calculating the lower and upper bound of the HHI. Therefore, we will not compare these other competitions in terms of the level of competitive balance with the top 5 European football leagues.

## 7. CONCLUSION

In competition policy, cartels are considered one of the most serious violations of competition rules and are treated as a criminal offence in some countries. Nevertheless, we have shown that the cartel in the sale of media rights might be beneficial and welfare improving. The EC defined the rules that must be met so that

this agreement could be exempted from the restrictive horizontal agreement. In some sports competitions collective sale of media rights has improved competitive balance, while in others, such as Formula 1, there is no evidence for such a claim. Hence, competition authorities should monitor whether part of the teams has made collusive agreements in sharing media revenues.

We have calculated the level of competitive balance for the top 5 European football leagues by using the adjusted HHI index and calculated the average value of this index for 16 seasons for all 5 leagues. The results provide puzzling conclusions since the Bundesliga that does not have the criterion of equal sharing of revenues among teams has the second highest level of competitive balance. However, we believe that by including more sports competition in the sample, it could be shown that equal sharing of media revenues improves competitive balance. Unfortunately, due to methodological constraints, we could not perform this kind of analysis for the other sports competitions analysed in this paper. However, we believe that comparisons between different sports competitions might reveal that equal sharing of revenue positively affects competitive balance. But in order to prove that, the measure of competitive balance should be properly adjusted to the nature of competition, which is an avenue for further research.

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