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APPLICATION OF COMPETITIVE BALANCE IN THE EUROPEAN SPORTS SECTOR AND IN THE AMERICAN PROFESSIONAL SPORTS LEAGUES

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TABLE OF CONTENT

SUMMARY **3**

INTRODUCTION **4**

I. LITERATURE ANALYSIS **7**

1. Competitive balance as a business goal 7
   - 1.1. League objectives 7
   - 1.2. Club interests 10
   - 1.3. Fan experiences 12
2. Competitive balance as a research topic 15
   - 2.1. Effects of competitive balance 15
   - 2.2. Effects on competitive balance 19
   - 2.3. Breaks on competitive balance 22
   - 2.4. Categories of competition balance 24
3. Competitive balance as an ideal type 25

II. EMPIRICAL RESEARCH METHODOLOGY **27**

1. Standard deviation 27
   - 1.1. Winning percentage 28
   - 1.2. Point percentage 30
   - 1.3. Shared percentage 31
   - 1.4. Statistical comparison of the percentage-based metrics 32
2. Dispersion 34
   - 2.1. Range and spread 34
   - 2.2. Extreme values and symmetry 35
   - 2.3. Swing and average line 36
3. Distribution 38
   - 3.1. Histogram and smoothed curve 38
   - 3.2. Sporadic records and bins 39
   - 3.3. Discrete and normalized values 40
4. The perfect competitive balance and an alternative methodology 41

III. RESEARCH RESULTS AND DISCUSSION **46**

1. Sports operational decisions 46
   - 1.1. The appearance of business mentality in European league decisions 47
   - 1.2. League expansion vs. league reduction 48
   - 1.3. League merger 50
2. Controlling the labour market 51
   - 2.1. Squad limit 51
   - 2.2. Squad cost limit 54
   - 2.3. Salary caps 55
   - 2.4. Salary structure 58
3. Redistribution of resources 59

3.1. Revenue-sharing model 59
3.1. Luxury tax 61
3.2. Redistribution of broadcasting revenues 62
CONCLUSIONS 66
REFERENCE LIST 68
ANNEXES 70

SUMMARY

This study compares the strategies that affect competitive balance in the American major leagues and the significant European football competitions. The research topic shows similarities to social stratification, resulting in the statistical approach applied to social science aspects also appearing in the study. The methodology relies on the perfect competitive balance created in this study. The interest of the sports business is to tend to as many teams as possible in this ideal statistical range of perfect competitive balance. Strategies and league decisions are evaluated based on how well they achieve this expectation based on trend analyses. It can be stated that the American major leagues have advanced tools to improve the uncertainty of outcomes. In contrast, European leagues strive for financial stability, which rather conserves the market conditions but does not compensate for disadvantages.

Keywords: competitive balance, financial sustainability, revenue-sharing, salary cap, sports leagues, uncertainty of outcome.

INTRODUCTION

The **relevance and topicality** of the research is given by the European sports leagues and the Euroleague Basketball have been making serious efforts to ensure fair, sustainable and balanced conditions of competitions. These regulations go through a certain evolution. The primary goal is to save the European sports market from professional club bankruptcy. In the second step, financial fair play and sustainability regulations try to prevent intensive capital inflows that threaten the balanced and organic development of the sports market. Finally, at the third level, we can discuss the measures that intend to create a balance between the teams participating in the competition, even by active sports market measures affecting the clubs' financial decisions. This regulatory development is less typical in European football, while in the American sports market, promoting the unpredictability has a longer history for a greater and stronger fan engagement can be achieved. Striving for competitive balance, in a certain sense, is a process of how the defensive measures turn into active market development. In other words, how is the sports operation transformed into sports business.

The **research problem** addressed in this paper in this paper is what are the structural and regulatory solutions serving the competitive balance. The need for competitive balance in the United States appeared earlier, the first rules were born in the 1980s, and nowadays, the American major leagues have the most developed and sophisticated regulations. The European sports model varies, both in organizational structure and in competition operation, and the European leagues walk on different development paths. At the same time, the American and European sports business looks for the answer to the same question: *how can we produce higher unpredictability*? Despite the continental comparison is only conditionally valid because of the fundamental differences, but it is able to show how the nature and the strategies of competitive balance can work in different circumstances.

The **object** of the paper is the concepts, strategies and implementations of competitive balance in European football and American major leagues. The uncertainty of outcome in the American major leagues is historically significant. However, due to the different development of sports markets in Europe and North America, consequently, comparison should be approached with caution. As accurate information is needed for comprehensively analyzing and understanding strategic decisions and their conditions, the main object of the research is determined by the data quality and validity. Therefore, in this paper, the European football is regarded as starting point. The vast majority of studies in the European research scene are about football. Due to its popularity being undeniable in Europe, much more data are available on how the sports business works in football. In this study, the default vocabulary connected to football, for example match and not games, draw and not tie etc. The sport or league-specific terms will be used when it is typical to the object of the analysis.

To avoid conceptual confusion, it is important to distinguish between *American major sports* and *American major leagues*. The former refers to American-born sports such as baseball, American football, basketball, and ice hockey. The last two spread relatively quickly and became popular in Europe as well, and at this point the concept of major sports and major leagues become separate. For example, Euroleague Basketball is the European contest of an American major sport. The reverse process of this sport export-import is that English-born football is persistently tried to make popular in North America. Although it would be disputed by many, in this study, Major League Soccer is considered an American major league besides because the organizing concept is closer to the North American model than traditional European football competitions. A broader interpretation will also be used for European football. In addition to the traditionally big four top leagues, also the big market leagues, in terms of their population, are observed that are currently integrated into the continental ecosystem (Table 8 in the Annex). The UEFA Champions League will appear partly, but the competition format does not make it properly investigable in regard to competitive balance. However, as the main organizational body of the European football market, UEFA is a decisive actor

The **aim of the research** is to compare the competitive balance or imbalance in the different sports and leagues, and to understand the concept and strategies that equalize the resources of league teams and ensure financial stability and sustainability. As the research of competitive balance started from the United States, the methodology was tailored to the American major leagues. For comparison with European competitions, or even for a deeper understanding of the nature of competitive balance, the methodology needs to be adapted and made more precise. The European sports market and its development raised many questions, most of which are easiest to illustrate through football examples.

To reach the aim of the paper the following **objectives** were set:

- to understand the layer of competitive balance,
- to find a methodology for intercontinental comparison of the competitions, and
- to identify the business strategies to improve the competitive balance.

The **thesis is structured** in three chapters. In the **first part**, the conceptual and theoretical framework will be presented. The purpose is to learn the relevance and diversity of competitive balance in interpretations. Due to the differences in the American and European sports markets, including the business objectives and mechanisms, the historical development of the research topic is also different along the continents. In North America, where the uncertainty of outcome is a fundamental value in the sports business, most research tries to reveal the effect of competitive balance on fan attendance. In the European research, the relevance of competitive balance is more emphasized. Merely a few studies deal with the effect of business strategic decisions made by leagues that influence and improve competitive balance. The literature review includes the relevant and traditional methodologies of competitive balance.

Since the first two parts present the complexity of the topic, the **second part** is dedicated to defining the scope and an alternative approach to the research. Considering the competitive balance as the arrangement of the members in the population starts from the traditional methodology. Using common ground, the competitive balance metrics on the American major leagues and the major European championships will be re-measured for intercontinental comparison. Understanding the scientific background of dispersion and distribution opens the opportunity for an alternative and better interpretable measurement. It is important to accept the high volatility of sports statistics. The factor of luck is significant. As the measurement of competitive balance is derived from sports performance, the noise of the data affects the competitive balance metrics. This fact fundamentally overrides the validity and interpretability of traditional methodologies. However, understanding that the random probability in the background of luck can be predicted opens the way to an alternative approach.

Finally, the **third chapter** presents in detail the strategic decisions of the leagues that aim or have the effect of improving competitive balance. Since competitive balance is a fundamental value in the American sports market, sports business measures are examined through European optics to see how they can be adapted to the European sports market. Using an alternative methodology, the study attempts to identify the impact of the strategies on the development of the competitive balance.

The **research method** is statistical analyses. On the first hand, the **information sources** include the sports performance of team and leagues. All data are generated from the standings and statistics on the official websites of the league. In cases where the regular season of the league does not end until December 2024, data from one season earlier is used for comparison. The availability of most business data is severely limited. For this reason, in this study, data sources and collections are accepted as credible if they are considered by the public to be valid. Even if this data is not completely accurate, it is unlikely to distort observations and interpretations of logical connections in large bulks. The strategies and league decisions are examined using breakpoint analysis, assuming that the impact of a new regulation can be detected in the change in the competitive balance trend within a certain time.

I. LITERATURE ANALYSIS

1. Competitive balance as a business goal

In order to understand the theoretical and conceptual framework of competitive balance and its different forms in appearance, in this chapter, it is necessary to briefly deal with the backgrounds of different competition systems and league structures in North America and Europe. The historical overview is important because it reveals the spirit that fundamentally determines how competitive balance is handled, and what it means for the actors in the sports business, the fans as customers, and the club and league managers as leaders of the producer entities. Since the concept of competitive balance has multiple layers, competitive balance as a research topic is not unified either in approach or in methods. The fundamental discrepancies help to learn how the competitive balance appeared as a business drive to satisfy the fans' expectations and how the research topic developed to satisfy the business requirement to create strategies.

1.1. League objectives

The competition system of American major sports, like baseball, American football, basketball, and ice hockey, regardless of which continent they are played, a season is split into two phases: regular season and post-season. The first part is a round-robin, the second part is a knockout system (called play-off in most time). The differences can be found in the details. In North America, the teams play as many matches as possible in the regular season, and the first purpose is to maximize the revenues. For example, 162 regular season games per team in baseball, 82-82 games in basketball and ice hockey. Due to the physical strain of the sport, American football is an exception with 17 games in the regular season. The American major leagues are considered continental leagues, as they cover a 375 million population area (plus 128,5 million people if Mexican teams join the leagues). In each American major leagues, 30-32 franchises constitute a tight and close business alliance.

In contrast, European continental competitions rely on the domestic leagues. The participants are varied as the national best teams of the previous season can qualify for international stage. Nowadays, according to sports business requirements, the European competitions are transformed into two-level competitions with regular seasons and a knockout system, similarly to American major leagues. The significant difference is the number of matches, as the European teams takes part in more competitions parallelly. While American-born sports have play-offs also in the domestic leagues, the football leagues retain the traditional competition format, and the teams play just a round-robin "regular season". Concisely, the American system was adapted in Europe, but the sports operations attitude has not been pushed to the background by the sports business purpose.

Historically, the predecessors of the current American major leagues were a simple round-robin competitions similarly to European championships. The significant difference was that the business interests to create leagues. While the sport was amateur and highly localized in Europe (Vamplew, 2019), in North America, geographical distance in North America was a challenge that business interests had to overcome. It is particularly interesting how a baseball team could play more than 150 games per season, with 600-1200 miles (1000-2000 km) distance long before civil aviation. The competition system of American football (before the AFL–NFL merger) was very flexible because the number of teams widely varied by year, not everyone played everyone, and even the match numbers were low and different by teams. It is a bit crazy, if the final standing was not clear based on the winning percentage, then the champion was decided by voting. It does not sound like a sports business, does it? The league stipulated as early as 1920 that the payroll of teams could be at most 1,800 dollars (roughly 32,000 dollars nowadays) per game. We can consider this rule the first one to ensure the equality of teams and competitive balance.

The leagues within Europe and North America found very different solutions to how to deal with the dilemma of geographic distances and limit of expansion in the early period of professional sports. Ice hockey teams were geographically combined in small (and often here today, gone tomorrow lifespan) leagues. Basketball was also extremely fragmented and professionalism appeared later. Interestingly, the playoff existed in both sports, the best teams played semi-finals and final, even if the leagues include 7-10 teams. The much more popular baseball leagues froze the number of teams, and to reduce the travel difficulties, they played games in bunches. This model is still alive today. When a team is on the way, it plays three matches with the host team in a few days. This method eliminates travel fatigue, and the advantage of the home field is blunted, thus resulting in more balanced matches and competition. In American football, a concentration began, and the number of teams decreased, but it has traditionally remained that the teams have not played a full round-robin. To determine the champion, and avoiding the abovementioned voting, the Championship Game as a final was introduced in 1932. One year later the teams were split into two divisions to overcome the travel difficulties, and the division winners played the final for title.

While in North America, the division means a geographical or horizontal split, in Europe, it is a vertical classification of teams. The American leagues prevented the risk of dilution by limiting the number of teams. In a business sense, they optimized the market to avoid the competitive imbalance. The European leagues were more solidaristic and, firstly in Scotland and England, the football leagues were segmented into hierarchical tiers (Vamplew, 2018). So, while European sports did not control the clubs as business entities and the competitive balance was resolved by creating open leagues with a promotion-regulation system, the American leagues in a sport were organized (and later centralized) along the business interests for promoting the competitive balance.

Although there are differences in the details and a shift in time, the process how today American major leagues were created is very similar. The rival leagues realized a business opportunity in a big final: the World Series in baseball since 1903, the Stanley Cup in ice hockey since 1914, and the Super Bowl in American football since 1966. These duels, as initial partnerships, promoted the standardization of rules and legal convergence. Later, it was developed into a more efficient control player salaries and better bargaining positions for broadcasting revenue. At the end of bridging the gaps, the rival leagues merged under a single brand. In baseball and American football, it did not mean organizational centralization and improvement of the competition system, merely the former leagues (keeping their names to this day) continued to function as conferences within the new league. The teams did not play games against teams from the other conference. Consequently, the league merger did not serve the competitive balance in every case, however, the control over the athlete market and selecting the talent players affected the competitive balance.

The ice hockey and basketball leagues in North America were much more motivated by market mergers as originally, the competitions were too fragmented and small. The leagues merged in several phases up to the NHL–WHA merger in 1979, and the east-west conferences were reorganized many times. The inter-conference games, and multi-step playoff known today was also introduced in basketball and ice hockey already when there were only eight teams in the league. Concisely, leagues that were considered niche sports at that age (nowadays, there are ice hockey teams in Florida, and they even won the Stanley Cup) used more innovative means to popularize the sport through the competitive system. Many elements have emerged in European basketball and ice hockey such as playoffs, and it is not unprecedented nowadays for leagues to cooperate (or just host teams from another league) in order to create a better sports product with a higher competitive balance. In this question, the European football is much more conservative. The forming of regional leagues is not supported even if it is cooperation between non-competitive markets of small countries.

For a long while, the conferences operated separately, and the teams did not play inter-conference games, there was less opportunity for big team rallies in the regular season, as opposed to the traditional European championships. In American football, even after the AFL–NFL merger, teams traditionally play a few matches in groups of 5-6 teams in a short regular season before the playoffs. In other American leagues, the regular season, which consists of many games, dwarfs the importance of the game. It is a fact that plenty of games help to assign in a more deserved manner the teams for playoffs. In addition, as the conferences were separated for a long time even within leagues, it led to less variety and less rivalry. For example, in Major League Baseball, there were two franchises in Boston, Chicago, Philadelphia, and St. Louis, and three in New York. Each city rivals was separated into two conferences and never met until introduction of the inter-league games in 1997 but by then most of them had been relocated. Each team played 154 games in a single season, but the

16 teams were strictly separated. The competition system inclines the fans to turn more attention at the end of the championship. This still echoes in academic research even nowadays when the competitive balance is measured based on the fluctuation of the final winners (Herfindahl-Hirshman Index, see later). In the thinking defined by European football, in the absence of playoffs, the competitive balance focusing on the regular season will be more prominent.

Finally, derived from the different historical backgrounds of European and American sports and leagues, there is another important factor affecting the competitive balance as a business purpose and as a research topic. North American franchises are value-neutral. European clubs represent local identity, social classes, or sometimes even political beliefs. Sports business thinking is much more aimed at global fans. Sports operational thinking builds much more on local fans. In North America, the market expansion is dictated by league interest, and the improperly operating franchise can be relocated. Moving teams in Europe is hard to imagine. In summary, fan culture developed differently in North America and Europe due to sports business attitudes and partly in the absence of rivalries. Competitive balance is approached differently, where the league is at the starting point of business thinking, and differently where the club's interests are in focus.

1.2. Club interests

A fundamental difference between the North American and European sports models is the relationship between the franchise or clubs and the league. An American major league has powerful leverage to assert its interests. Even forcing an owner to sell a franchise, as happened to Donald Sterling and the Los Angeles Clippers in the NBA. Contrary to popular belief, the franchises are not owned by the major leagues, but the primary interest of the league is determined by a strong contractual relationship like a consortium. In contrast, the organizing bodies of the European football leagues have less mutual business interest with the club, and the problem-solving is more based on disciplinary powers. A third type of partnership is in the MLS and the Euroleague Basketball where the clubs own the league. The general premise is that competitive balance can prevail better in the traditional American major leagues because the consortium relationship there provides a more favourable breeding ground for it, while, in Europe, the interest of big clubs precedes the leagues. As will be explained, these statements have truth but also the strategic design has a decisive role. The important question is how to provide a balance between the big-market and small-market franchises or clubs in the hope of leading to higher revenue for the league as a whole, but not causing damage to clubs who are the flagships of the leagues. Football teams that are successful at the international level also bring reputation and interest to the domestic league. Managerial dilemma of how to strengthen competitive balance in a league without damaging top clubs.

Nowadays, the league's budget relies on broadcasting revenues. Legitimacy is derived from distributing a significant part of this income among the teams, and it provides a strong ability to enforce central interests. However, before centralized broadcasting revenues, the leagues were limited to operating the competitions, and they carried out their organizational tasks mainly from the licensing fees, partly from sponsorship. That is how even the business-based American major leagues worked a century ago. The leagues were able to function if there were enough teams with capital to produce sport. The league was responsible for the sports operation; the franchises ran the sports business. The fact that the competitive balance appeared relatively quickly on the American sports market, even long before broadcasting, shows that the clubs recognized the common interest relatively quickly.

The fact that the competitive balance appeared relatively quickly in the American sports market, even long before broadcasting, and the franchises were willing to limit their access to financial resources shows the recognition of the common interest. In the development of American sports, there are several examples of the merger of leagues, which indicates a highly cooperative approach. However, these mergers were preceded by the founding alternative leagues which could provide better conditions for the franchises than the existing leagues. In the long term, the partnerships and, later, the league mergers were dictated by also the franchise's interests. In practice, they went through the Nietzschean process of *thesis-antithesis-synthesis*.

In contrast, the European leagues basically remained within the framework of the nation-state, and in many cases, the governments provided a monopoly over the league operation. Moreover, European broadcasting companies were founded by governments. Concisely, the European sports market was under state control. In this structure, the governing body of the league was not forced to create a balance between the clubs. Even the European competitions starting in the 1950s pushed the national leagues to promote the flagship teams, strengthening the league's reputation with international successes. The turbulent sports market that existed in North America before broadcasting, in which rival leagues rose (or failed), formed partnerships on a sports business basis and ultimately merged into the modern American major leagues, is missed in the European sports market. The healthy dissatisfaction and potential for action brought revolutionary solutions in two cases in Europe: the English Premier League in football and the Euroleague Basketball.

Digital broadcasting has created a new situation in the European sports market. In addition to local fans, global fans appear in large numbers. The significant revenue gives the leagues a powerful tool to shape the balance among the teams. However, the competitive balance as a business goal can only be discussed when the big clubs and leagues realize the advantage of cooperation in the long term and strategies are associated with the purpose. Otherwise, competitive balance can be discussed just as a sports operational phenomenon.

1.3. Fan experiences

Manchester City won the Premier League six times in the last seven seasons. Probably, Pep Guardiola is a genius, in the seven seasons before the Premier League, he became champion three times with Barcelona and three times with Bayern Munich. Based on the last twelve years, it is easy to think that the Bavarian team has such a power advantage that there is no question about who will be *Meistermannschaft*, and they only stumbled last year, but in fact, more than a decade ago, the German championship was much more diverse. This can hardly be said about La Liga, which has been dominated by Real Madrid and Barcelona since the beginning of time. Juventus won the Serie A nine times in a row in the 2010s. Paris Saint-Germain is the best team in the French league even after parting ways with star players. The dominant teams may change in a certain period. Lyon and Internazionale also had periods when they were unapproachable. And the manager legend, Sir Alex Ferguson won the league title 13 times in since 1993 with Manchester United. Concisely, in European football, the circle of potential winners can be drawn by everybody even at the start of the season (Figure 18 in the Annex).

In top European football leagues, in the last three decades, there are more periods when a team rules like an absolute monarch. Naturally, any statement does not have one hundred percent truth, and from time to time, dominance is broken as a refutation of competitive imbalance. Actually, the exceptions prove the statement, as they would not be considered exceptions if the trend was not accepted. It is interesting that sometimes the teams making a splash shine a light on another kind of competitive imbalance. In the previous season, Bayer Leverkusen won the Bundesliga with 17-point lead. Liverpool swept the board in 2018/19, with an 18-point advantage over the second-place team and thrashing the third place by 33 points. At most, a third of the seasons can be regarded as neck-and-neck competition.

In the past ten years, in a third of the seasons of the top five European football leagues, the fans were not overindulged with an exciting title race when the difference between the first and second place was less than two wins (0 to 6 points). More competing teams to title would strengthen the feeling of competitive balance. This usually doesn't happen. The bigger deficits are more typical, sometimes such an extreme instance like when Bayern München secured the title with a 21-point margin in 2017/18, or there was a 31-point chasm between Paris Saint-Germain and the league in 2015/16. Nevertheless, the Bundesliga and Ligue 1 are relatively diverse in the sense of most flashes in the pan – the teams that could reach the podium in the last ten seasons, even if just occasionally. (Figure 19 in the Annex).

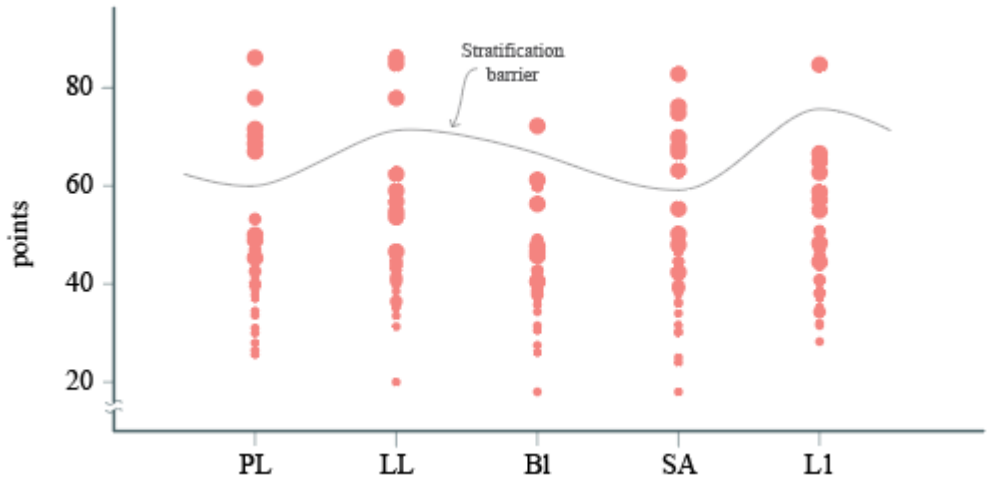
In other leagues, the cream on the coffee is much thicker. Internazionale and Juventus are clearly the most stable clubs in Seria A. Milan and Napoli have also won championships in recent years. The clubs following them are more difficult to judge. New entrants in the elite, such as Atalanta

reached the Champions League group stage many times. Meanwhile, the glory of historical clubs belonging to *Sette Sorelle* (Seven Sisters) is fading, they struggle to keep up with the elite, or they are slipping and disappearing. This is a very simplified outline and does not mean that the sleeping giants cannot awaken. So, in Italy, some kind of fluctuation at the top of the league can be detected.

At first glance, the Premier League is similar to Seria A, as the cream is thick. The clubs belong to elite is called the *Big Six*: Manchester City, Arsenal, Liverpool, Manchester United, Chelsea and Tottenham Hotspur. It does not mean that their performance is balanced in every season, and the first six places are always occupied by them. And, actually, it does not mean either that all of them have a chance to win the competition season by season. Arsenal has not been champion for 20 years, and Tottenham has never. When Tottenham finally had a real chance for title, then Leicester City jumped the queue and won by 10 points in 2015/16. The performance of the Foxes was such a multi-decade miracle that they were given the nickname "The Unbelievables". In spite of this, they could not stay among the top teams, and since then they had a visit in the second division.

A kind of stratification, which is similar to coffee, in that there is a relatively fluctuating large block of teams under the stable top layer, is typical of all European football top leagues. The position and the strength of the stratification barrier between the blocks can vary. Some seasons bring surprises and unpredicted results, and the fans may have a competitive balance experience, but in the long run, a rigid pattern emerges. The figure below shows the performance of the clubs over a ten-year period. The size of the disc indicates the number of seasons the teams spent in the first division. However, the focus is on how wide or narrow the ditch is between the blocks.

Figure 1 – Stratification by the average point of the teams in the top European football leagues in the last ten seasons



Here is an example of how difficult it is to break through the barriers. West Ham United is a stable and historic club with the fourth-largest stadium in the Premier League. There have been a few worse seasons in the past, maybe also the specter of relegation loomed over the team but they

appear more often on the international stage and even won the UEFA Europa Conference League in 2023. They had the following record against the top three teams in each of the past five seasons: 7 wins, 5 draws, and 20 losses. Sevilla won the UEFA Europa League five times in ten years, but they could not convert the international success into entering to Spanish elite and expanding the *Três Grandes* (Big Three).

The fluctuation between the middle and lower thirds of the leagues is relatively strong. Moreover, the phenomenon that a middle team can relegated to the second division, on the one hand, shows the sensitivity of the sports and, on the other hand, indicates a competitive balance among teams under the cream. Only nine to eleven teams can be regarded as stable participants in each top football league, who belonged to that in each of the previous ten seasons. The turnover between the divisions seems quite high, especially considering that almost half of the arrivals from the second tier can secure survival in the higher division, and only the other half are dropped immediately or in the following season.

An important distinction should be made among the fans. The supporters of the powerhouses focus on the trophies, even internationally. They hope their favorites will be in the fight for the title as long as possible. They are the expected winner of most matches, and even if it is not always easy, the opponent usually gets tired at the end of the matches. The mid-table teams' fans may hope for an exceptional season, and reach a qualification for the UEFA competition. And, if it is managed, in many cases, fans are faced with the fact that participation in an international cup, especially a march, is at the expense of domestic performance. The resources of these teams lag behind the top teams. They cannot have a seat at the table, at most, just spoil the party. The fan experience is even worse for small teams, especially those who are promoted from the second tier. They believe in survival and focus much more on the matches. The occasional underdog victories against the bigger teams make them happy for a few weeks. Perhaps, these examples symbolize well the last component of the fan experience: chance to win the match.

In summary, when a league and the teams as sports business producers would like to be more successful and to reach more fans as customers, and the competitive balance is recognized as one of the pillars of business purpose, then the current fan experience and its shades must be taken into account. In the strategy design, it is important to determine the priority order of the aspects and manifest of competitive balance. Assigning the hot spots in the business strategy must rely on objective and numerical observation. Consequently, it means a challenge for researchers to measure as many dimensions of the competitive balance as possible to provide a complete picture.

2. Competitive balance as a research topic

Scientific works dealing with competitive balance can be divided into three categories based on the impact analysis. The first one, in chronological order, is the examination of the competitive balance effect on fan attendance. These studies are typical of the American sports market (especially baseball), where competitive balance is a fundamental value and business purpose. Also, a few European adaptations and other approaches will be discussed. The second category deals with the reasons for the lack of competitive balance. Due to this phenomenon, it is a European research topic. Although there are numerically few studies, and the methodology is the most sophisticated neither, the significance of their findings is undeniable. Finally, the third category includes studies that do not focus on a transactional view but rather work out the methodological measurement and outline the trends. The limitation of this section is that it does not present the methodological details. Another chapter is dedicated to understanding statistical backgrounds. The purpose of this part is a literature review to illustrate the diversity of the competitive balance in scientific works and the main conclusions or debatable characteristics.

2.1. Effects of competitive balance

The development of competitive balance can be traced historically. The sports business purpose was to increase fan interest and attendance by offering exciting games and uncertain outcomes. Of course, this is just one pillar of viewership. Mostly nowadays, the availability and significance of marketing techniques and channels are higher. When Gerard Scully attempted to quantify the components of attendance in Major League Baseball games, the ticket system seemed the strongest factor. The period examined is before digital communication and marketing, and the rough average occupancy was 60-70% of the capacity of ballparks (approximately 25,000 people per game). So, it could be supposed reasonably that the price had an effect on attendance in MLB. Unfortunately, the availability and validity of the data about ticket prices are not perfect in the past. The measurement of how the uncertainty of outcome affects attendance in the ballparks met methodological difficulties. Consequently, the relevance of Gerard Scully's results today should be treated with criticism. The numerical findings are merely approximate. Despite these uncertainties, however, the illustration of the weight of the factors is more important. The average attendance for a franchise in a season was around 2,100,000 in 79-82 home games. The -1 USD ticket price difference meant 172,000 more viewers. A win (+0.6% in winning percentage) resulted in 21,000 extra viewers. Demographic factors such as urban population and per capita income showed a negligible correlation. And finally, competitive balance showed a positive and significant, but contradictory and non-generalizable effect (Scully, 1989).

The confusing conclusion indicates very well the methodological uncertainty of how the uncertainty of outcome can be measured. The volatility of competitive balance indicators and the records of fan attendance are also quite high. Later, others tried to explain the phenomenon discovered by Scully. If the change in attendance is observed in a one-year period, the sky-rocketed performance attracts more viewers, while the league's competitive balance is skewed by the exceptional on-field achievement. In a three-year period, however, when the special phenomenon begins to fade, attendance suffers a setback. So, the conclusion is drawn that overall, the competitive imbalance causes a decrease in the number of viewers (Schmidt & Berri, 2001).

Young Hoon Lee and Rodney Fort used a better methodological approach. On the one hand, they examined decades of periods to eliminate the confusing effect of volatility. On the other hand, they defined the concept of uncertainty of outcome more precisely. Playoff uncertainty had a statistically detectable impact on the attendance in the entire season. On this point, it is necessary to clarify what playoff and playoff uncertainty mean in baseball. Until 1968, only the regular season winners of the conferences, the American League and the National League, played in the World Series final. In 1969, the conferences were divided into divisions, and the division winners played in the League Championship Series as a semi-final before the World Series. The playoff, as we know it today, was introduced in 1995 in the MLB. This sports operational development had a significant impact on fan attendance. The essence of playoff uncertainty (in other studies referred to as season-level uncertainty) is which teams will qualify for and succeed in the championship final, conference final or playoffs. At that time, when the bracket playoff system did not exist, if people guessed which team would be qualified for the World Series, then fan interest and attendance in the regular season were lower. This trend was observed in the American League conference in MLB between 1948 and 1963. (Lee & Fort, 2008).

Brian Mills applied the above methodological approach in the “neglected NBA, NFL, and NHL”, and found difficulties in showing a relationship between uncertainty of outcome and annual league-level attendance. The Boston Celtics won 10 championships between 1958 and 1969, but attendance continued to grow steadily. It is an important part of the truth, that in that age, the NBA was still in baby shoes with around 5,000 spectators. The long-term trend of fan interest in all American major sports has been increasing since the leagues were founded (up until the writing of his study). A more interesting finding is the explanation of certain breakpoints detected in each American major league. In baseball, attendance jumps after world wars while during that, was not decline. General findings are that conflicts such as splits, player strikes, and lock-outs have a detrimental effect on leagues, and conversely, fan attendance leaps by league expansions or mergers (Mills & Fort, 2014). Neither Lee, Fort nor Mills mentioned the effect of changes in the competition system on fan attendance or the uncertainty of outcomes.

Although the above research analyzes viewership growth as a fundamental sports business goal, it ignores an important factor. Probably, even non-baseball fans heard about New York Yankees' starts, such as Joe DiMaggio, who won nine World Series titles in 16 years until 1951, or Mickey Mantle, who won seven ones in 12 seasons after 1951. It is a fact that during this time, the American League conference in MLB suffered a significant attendance decrease for decades due to lopsided champion race. However, from another perspective, commonly known, the stars are a decisive part of the sports business, and it is not innovated by modern sports. Sports memorabilia and merchandising started with baseball cards in the 19th century. The tobacco companies, one after another, began to boost the sales of their products by placing collectable baseball cards in tobacco tins or cigarette packages. These colourful lithographic papers featured famous baseball players with individual statistics and a mini-biography and were added to the wallets alongside family and love photos. So, the star players had a significant role in popularizing the sports even before the mass communication.

It has several examples also in our age. The advent of social media and digital broadcasting has amplified the influence of star players on viewership. In football, Real Madrid president Florentino Pérez sold the club's training complex to achieve an aggressive transfer policy and start the era of the *Galácticos* (Galactics). More Asian football leagues invested in transferring high-profile European footballers to build up a profitable sports business. That concept caused higher attendance in stadiums and viewership on television, while the concentration and competitive balance of the leagues did not change significantly. Is it possible that elevating star athletes to icons and heroes could overshadow the importance of competitive balance in sports business decisions? Daniel Plumley's conclusion is that the relevance of competitive balance as an important component in modern-day sports is doubtful (Plumley et al., 2023). However, there is an important difference between the above examples. Most American sports leagues have been trying to prevent the concentration of star players even before the digital age. The strategies and leverages used for this will be analyzed later. Asian football leagues, mainly in China or Saudi Arabia, are trying to start competitive and balanced professional leagues distributing government support evenly. Actually, Major League Soccer in North America has a similar purpose with a significant difference in that the source of capital is private investments. In contrast, in European football leagues the centralized measures were barely experienced to handle the impact of invested capital or growing broadcasting revenues on the player transfer market.

The impact of outstanding players and team performance on fan engagement is undeniable. However, the academic results regarding the uncertainty of outcomes are blurred. Some early studies suggest that the probability of a home win plays a stronger role in stadium attendance (Peel & Thomas, 1988). The relevance of competitive balance is difficult to filter out from the overlapped

effects on attendance and fan preferences. Tim Pawlowski applied a simple social science method to reveal the relevance of competitive balance: a questionnaire survey. Seventy per cent of the fans in the Bundesliga care about the competitive balance. However, probably the measures to improve balance would not have any significant effect on consumer demand (Pawlowski, 2013). Another promising method was applied by Wladimir Andreff and Nicolas Scelles. Their regression model included the smallest details of Ligue 1, the French football league. Even the hooliganism, the average number of goals, and the starting time of the matches. The author investigated the volatility of per-game attendance in relationship with the chance for changing in league standing position. As emphasized, it is a peculiar version of competitive balance. A positive relationship between attendance and close position in league standing was revealed. In addition, the study confirmed the significance of geographical rivalry and the positive effect of promotion from the second division. (Andreff & Scelles, 2014).

The spread of digital culture is fundamentally changing sports markets and, consequently, the scientific work dealing with them. A significant change since Scully's work is that stadium or arena occupancy is at the peak in most continental leagues. Except for baseball, the reasons for this will be discussed later. While the stands in a sports facility are sporadic, it means an economic surplus, and the price reduction can generate a higher attendance (Scully, 1989). In this case, the ticket price is an independent variable having an effect on the viewership. However, when the stands are full, it means an economic shortage, and the clubs and franchises can raise the ticket price. In this case, attendance becomes an independent variable having an effect on the match day revenue.

With the advent of social media, clubs and franchises have gained an effective marketing and identity-building tool. In a decade, awareness of sports products skyrocketed. A target population is also available who were not necessarily sports fans before and probably never read the sports pages in newspapers. In terms of economics, the market is expanded by social media platforms. As a result, ticket prices increase and lead to limited access to live sports products. Increasing demand drives up ticket prices. Mostly, the opening of new stadiums and arenas often brings increased ticket prices, thereby changing the social status of those attending the match (Siegfried & Zimbalist, 2000).

To understand why the number of spectators in arenas, stadiums or ballparks became a marginal or at least secondary question, the answer appears in Tim Pawlowski's survey. The respondents were registered fans split into two groups: stadium sample and city sample. Although the result does not show significant divergences between the groups, it reveals that roughly half of the people belonging to the stadium sample visit the stadium at most five times in a season. Most club fans watch the matches on television, which would not surprise anybody nowadays, as the availability of digital technologies is unlimited. To demonstrate the significance of the changes, the statistics of Premier League teams between 1992 and 2002 show that gate receipts increased threefold while

broadcasting revenues increased more than 30-fold (Michie & Oughton, 2004). This serious increase in television viewership (and interest in watching matches in the stadium), despite the growing gap between the top and bottom teams, really challenges the relevance of competitive balance. Or at least it requires an explanation of the situation in which uncertainty of results is important as a customer demand. It can be assumed easily that fans are more interested in the uncertainty of outcomes among top clubs like in the middle-of-the-pack.

Before digital television, fans mainly had the opportunity to watch matches in the stadium. The capacity of the stadium determined how many fans could have a visual sports experience. However, in the present, there is no limit to how many fans can watch a match. So, while previously local fans were the consumers of sports, the focus has now shifted to global fans. It is important to highlight that a local fan can also be a global fan when watching matches of other teams or even other leagues. And sometimes the opposite is also true. A team can have fan groups in further countries and continents whose members are not born, raised or live in the same city as the local fans. As the competitive balance is a supposed leverage of global fan engagement, consequently, the digital viewership of matches may be much more relevant than stadium attendance.

Nowadays, the streaming platform has more sophisticated data as they require registration and logging in to watch a single game, in contrast to the linear television. The advantage of this match-level data against season-aggregate attendance is that it shows the volatility depending on several factors. The more detailed the data, the better the different effects can be understood. It would be much clearer how the big clubs' influence trails the viewership of the championship. If the competitive balance improves, the share of the medium and smaller teams will increase. Unfortunately, these business data are strictly protected.

2.2. Effects on competitive balance

The above academic studies examine the impact of competitive balance. This is a completely reasonable question, as leagues set the competitive balance as an objective. However, from a business perspective, it is more important to know the impacts affecting competitive balance. What factors affect, advance or hinder the achievement of the strategic objective? Unfortunately, this question is neglected in the majority of academic research. The reason is unknown. How Lee, Fort and Mills detected positive and negative break points in the development of attendance, the changes should be detected also in competitive balance along the strategic measures. For example, how do the revenue-sharing models impact the competitive balance in the American major leagues? These questions will be discussed a little bit later.

The relevance or topicality of competitive balance in the European football market is more difficult. In contrast to North America, the uncertainty of outcome is not a fundamental value. UEFA and some national federations have financial sustainability measures, but their purpose is not especially related to the relevance of competitive balance. Actually, European football avoids severe discussion on either the American improvements or other solutions such as squad limits, reforming the player transfer system, or other radical overhauls of the current regulations (Ramchandani et al., 2018).

Another important difference between the American and European sports markets is that while the American major leagues are considered continental leagues, the European competition system is duplicated. The UEFA Champions League was methodologically difficult to examine until reforming the competition system in 2024. In addition, it is a likely and valid assumption that the European continental cups distort the domestic leagues by the distribution of the international broadcasting revenue. The Premier League has become increasingly monopolized (Curran et al., 2009). Competitive imbalance in La Liga practically since its beginnings (Montes, 2012). The Turkish Süper Lig is dominated by particular teams (Gürel, 2012). Similar to the top leagues, in also the smaller leagues, the number of competitive clubs is limited (Pawlowski, 2015). Concisely, the lack of uncertainty of outcome is repetitively detected in European football.

A simple example illustrates how small market teams are at a disadvantage due to circumstances. In the metropolitan area of London, with a population of 15 million, the combined stadium capacity of seven Premier League teams is over 300,000. In contrast, Ipswich Town's stadium capacity of 30,000 is related to the built-up area of Ipswich, with a population of 180,000. The population per stadium in London is more than eight times that of Ipswich. Larger metropolitan areas are potentially more profitable than lower-populated areas. In other words, the size of the local market determines the competitiveness of the clubs. If these resource disadvantages are not compensated, the bargaining position of the smaller clubs on the player transfer market will be reduced. Ultimately, they will inevitably be unable to compete with big market teams. The asymmetric market power plays a significance role in the competitive imbalance (Vrooman, 2015).

The concentration of capital can be regarded as a normal economic mechanism. If ten companies work on the market, sooner or later, a few of them will be better and stronger, and a few of the others will be left behind. The stronger companies will devour the weaker ones. This process will repeat again and again in certain intervals until the market concentration with two to four companies. This phenomenon is detected by Aurélien François and his colleagues in the UEFA Champions League between 2001 and 2019. The uncertainty of game outcome declined. An ever-increasing gap between the best teams and the other teams is observed (Francois et al., 2022).

Of course, there are studies that shine the light on the important details of how the European football market is not functioning healthily, in a more precise and objective way. Jonathan Michie and Christine Oughton found the reciprocal effects work in sports similar to other industries. The higher revenue provides the stability of wage expenditure, resulting in better on-field performance, feeding positively the ability to generate revenues, providing funds for sports performance development and so on. So, the factors interact with each other in an upward spiral. In the long run, this process continuously increases the advantage of the best teams. The narrow cracks grow into crevices and ultimately open into chasms. In 2004, the authors mentioned that "clubs at the bottom of the league find themselves trapped in a vicious circle of poor performance." The stratification mentioned earlier in this study shows that today also the middle teams are stuck in the trap of mediocre performance. Obviously, sports performance is not transformed automatically and directly into business performance, but the fans' experience and the objective observation show that teams in a significant number are segregated. Outstanding performance of small or mid-table teams is sporadic. The teams of *Big Six*, *Sette Sorelle* or *Três Grandes* are permanently unbeaten. The competitive imbalance is strongly associated with the income chasm between the top and bottom teams (Michie & Oughton, 2004).

Some studies approach the issue from the cost side rather than the revenue side. General managers are responsible for the budget, players are custodians of scores. This accepted fact implies how off-field and on-field performance are linked. If the club or franchise spend more on payroll, it will result in sports success. Actually, every fan knows exceptions, which strengthens the relevance of the scientific question: Do player salaries affect competitive balance, or is it lacking? A study led by Stephen Hall compared Major League Baseball to the English football league. The observation confirmed the hypothesis that in the "unfettered" European player market, player spending and performance are correlated. So, the vast differences in market conditions cause competitive imbalance. In contrast, in the MLB, the restriction on the player market can affect the equality of sports performance (Hall et al., 2008). Actually, it is difficult to conclude that the observation is derived from different market mechanisms and regulations because the baseball player market is the least restricted compared to salary cap models.

The redistribution of revenues probably has a much more substantial impact on the on-field performance. The American and European markets also differ in payroll restrictions, but perhaps the more significant difference is in revenue management. In Europe, the league-source income comes from broadcasting rights. The American revenue-sharing model also disposes of the franchises' sports-related income. So, the small-market teams are supported, and the budgets of large-market teams are cut. As a result, player salaries are balanced (Berri et al., 2006., Rockerbie, 2024).

2.3. Breaks on competitive balance

In sports, the ownership model basically determines the financing opportunities. The historical entity form of the European sports is the social association: *United* in England, *Verein* in Germany, and *Sociedad* in Spain. The clubs were motivated to achieve better sports performance with player development and transfers. In this progress, sports became professionalized and later commercialized, and the community was turned into a business entity. Patrons around the clubs appeared relatively early, who were able pro-bono to provide the liquidity and a limited investments for growth. Practically, this sports model characterized European sports until the eighties-nineties. Meanwhile, the American major leagues gained their current form after mergers, in which franchises operate in a syndicate model.

English football was a pioneer in the transformation of the European sports market. The supporter trust model transformed the social association into fan ownership since the eighties when football became professional, but before its commercialization. This form of business entities opened the opportunities for stock market model in which companies and even city institutions acquired shares (Hamil & Chadwick, 2010). It typically meant a one-time or periodic capital increase because the fans were the main owners without a rational investor attitude. The capital was not used for long-term asset development, for example, sports facility development. The invested money was burnt for the player payroll or for the repayment of previous debts in the worst case. Before digital broadcasting, the investment return and profit were based solely on the increase in ticket sales. It was not viable after the legal restrictions on the capacity of stadiums since 1993 to reduce hooliganism and to avoid tragedies in the stands (Demil & Lecocq, 2010). By the turn of the century, many clubs were de-listed, as the share price dropped due to poor returns; currently, there are 22 clubs on European stock exchanges (Plumley & Wilson, 2023).

In Spain, following a financial crisis in the nineties, football clubs were made suitable for investment with the introduction of the new form of *Sociedades Anónimas Deportiva* (SAD). Only a few clubs remain social associations, such as Real Madrid and Barcelona. Since there is no capital owner, the operation and development are based on cash stock that comes from membership fees (maybe it can be regarded as a kind of ownership contribution) and from the highly unequal distribution of the league broadcasting revenues. After the high risk-taking budgeting of recent years generated debts, the cover of liquidity and the funding source of investments are the sold fixed assets (real estate, media rights) and the bank credits.

Summarizing the mechanism, the commercialization of football brought changes in the ownership structure. With digital broadcasting and increasing viewership, football clubs have become profitable and investment targets. In some cases, patronage was transformed into private ownership by families or businessmen (Juventus, AC Milan, and smaller English teams). In most cases a foreign

investor appeared from the United States (Manchester United, Liverpool, Aston Villa, AS Roma), Russia (Chelsea), the Middle East (PSG, Manchester City), China (Atletico Madrid, Inter Milan) or other Asian countries (smaller English teams).

This development of the European sports market, including the changes in the continental competition system, has brought European football (and basketball) into line with the American major leagues. With the emergence of business interests, the prominence of competitive balance was expected. Not entirely that happened. External financing was incorporated into the clubs as ownership and transformed into owner contributions (Plumley & Wilson, 2019). Although, in many cases, there have been sports facility developments, typically, the majority of the invested amount went into player transfers and chasing the titles without any realistic expectation of financial return. The maximization of sports performance at all costs was motivated by social reputation and sports washing. Sports investments lacking business rationality distorted European football. Competitive balance indicators have deteriorated in the big leagues (Ramchandani et al., 2018; Scelles et al. 2022).

The most significant difference between North American and European sports markets appears in the business environment. The American major sports operate in a syndicate structure involving the franchises. This organizational structure reflects the attitude that sports products are common and not produced separately by the teams. As a result, the model is centralized, and the league is the determining organizing force. So, the franchises are independent business entities, but they give up even a significant part of revenue in the interest of the common sports product. In contrast, European clubs enjoy much greater independence from the body organization of the league. Incidentally, one of the effects is that the political entities often step on the stage as regulatory actors.

The American major leagues determine the framework of the profit-oriented sports business, they strive to ensure equal conditions in the market players. The regulation is advanced and dates back several decades. There are two main groups of measures: revenue sharing and player market regulations. In contrast, the European leagues are traditionally responsible for sports operations. The sports business environment is only semi-regulated. The leagues have only taken action against monopolized markets in recent decades because of debatable foreign investments. The financial sustainability measures focus on preventing more severe distortion, but from a European perspective, radical American competitive balance measures have not spread in Europe. The economic relationship between the teams is unequal. In some aspects, for example, in the presence in the player market, the connection between the clubs is more similar to a subcontractor relationship. The abovementioned league strategies and their effects will be discussed in detail in the last chapter.

2.4. Categories of competition balance

All above approaches to competitive balance are valid. The undebatable fact is that the championship finals attract the most interest, and the variety of the champions promotes global fan engagement in sports. However, from the perspective of the sports business, the interests of both the league and the clubs require that every game and match be a saleable product. For this reason, the uncertainty of outcome in the regular season is more reasonable to be highlighted. The strategic decisions of the leagues do not primarily and directly regulate the struggle of a few teams for the championship title. The competitive balance and uncertainty of outcomes as sports business objectives are laid on a broader basis.

Categorization by Lee and Fort is a sensible idea: game uncertainty, playoff uncertainty and consecutive season uncertainty. It is important to emphasize that in this definition, playoff uncertainty refers to championship races during the regular season (Lee & Fort, 2008). In other words, competitive balance can be observed based on games, regular seasons, and champion titles. This approach is one level deeper and more sophisticated than the commonly used within-season and between-seasons competitive balance (Leeds et al., 2023). Most studies neglect the measurement of game uncertainty. It is beyond doubt that the observation of goals and scores has methodological challenges, but its scientific legitimacy is also unquestionable. Competitive balance as a strategic objective of the leagues is to promote fan attendance, viewership and engagement. The primary sporting experience for fans is the match and the game itself. The more games are watched, the higher the season-level cumulated viewership is. From a sports business perspective, every game matters. So, it is hardly possible to ignore the examination of game uncertainty.

This study does not address the number of championships or the market share-based approach to the dynastic issues of championships. The focus is on the regular season. According to the above approach, it can be measured in two ways: on-field and on-standing competitive balance. However, it must be noted that difficulties are experienced in drawing synthesized conclusions. In the American major leagues, game uncertainty swings, while playoff uncertainty representing the regular season is more stable in decade periods (Mills & Fort, 2014). The situation is similar in La Liga. The number of home wins is decreasing, and the number of away wins and draws is increasing. So, the gap between the teams is getting narrower. Meanwhile, the dominance of Real Madrid and Barcelona seems unbroken on the league table (Montes, 2014). So, game uncertainty and regular season uncertainty, or on-field and on-standing competitive balance are not correlated. Gary Lineker's quote makes sense: "Football is a simple game. Twenty-two men chase a ball for 90 minutes, and at the end, the Germans always win."

The apparent contradiction of on-field and on-standing competitive balance can probably be resolved if the research topic is approached from a social science perspective. Stratification, cluster, fluctuation, rotation, mobility, segregation — these terms also appear in the above chapters and studies discussing the framework and traditional methodology. These concepts are typical of the social sciences, and this approach is also reflected in the standard deviation-based measurement of competitive balance. The teams in a league are considered members of a population. The difference from societies is merely that the distance is measured not based on some social performance, but sports performance. According to the discussion in the previous chapters, the shared percentage is considered favorable in this study to observe the competitive balance.

In a scientific sense, the standard deviation is calculated from the average. Consequently, the central tendency is basically the focus. However, in sports business thinking, the issue of competitive imbalance or the purpose of competitive balance is more about how to pull teams on the edges to the center. The nature of peripheral sections and extreme phenomena should be emphasized better. The size of the standard deviation just refers to consistency or diversity but it does not explain. The higher value indicates a more significant variation within the population. Clusters or layers are likely to be identified. The performance is likely due to an uneven distribution of resources (Babbie, 2020). For this reason, in the following sections, the aspects of dispersion and distribution will be reviewed to better understand how diverse the arrangement of the elements of a population can actually be behind the standard deviation. The previous methodologies will be supplemented with data analysis approaches and practices applied in social research. Data visualization tools will be used more to better understand the phenomenon and cause-and-effect relationships.

3. Competitive balance as an ideal type

The academic study of competitive balance shows many similarities with the observation of social equality. In both cases, the members (teams vs. people) of a population (league vs. society) are examined through a non-physical (sports performance vs. social status) phenomenon. The similarity is also stronger along the contradiction between the research name and the research subject. The social sciences examine the inequality. The competitive balance researches detect the imbalance. The scientific function is similar too. The task of social science research is to provide support for social policy initiatives. This process, from scientific work to strategies, is called social development. Competitive balance research makes sense if strategic decisions in the sports business are made to promote the equality of opportunity between teams and, ultimately, the uncertainty of the result. This is for business development purposes.

The term competitive balance reflects an expected state and corresponds to the Weberian *Idealtypus* (ideal type). If competitive balance is considered an ideal type, the following statements are true. Its relation to observed facts is limited. Its establishment is reasonable, and it is partly realized, but in its conceptual purity, it cannot be empirically found in reality. Consequently, in terms of its content, the construction is utopian. However, the ideal type can be useful in scientific works for comparison and illustration purposes. The reality of the research topic becomes pragmatically understandable along an ideal type (Weber, 2019).

In other words, the ideal type is a reference value that can facilitate the interpretation of research. Creating appropriate scientific metrics can sometimes be challenging. Sometimes the complexity of a research topic does not allow a single metric to adequately describe the phenomenon. Actually, it is a requirement when the studies are used for decision-making. More metrics provide more information. More information generates better business decisions. For example, the difference between teams can be measured through league standings, but a conclusion can also be drawn from the goal or score result of a match or game.

For research results to be useful, it is important that the research construct is valid and sensitive in the sense that it numerically reflects the experience behind the business strategy requirement. Certain mathematical operations can lead to ambiguous results. For example, arithmetical squaring creates exponential values, and ultimately, the “market share” of the dominant team will be emphasized. The results of competitive balance research should harmonize with the business and fan experience. The validity of a scientific construct most likely also results in easier interpretability. This makes scientific measurement useful for strategy creation.

II. EMPIRICAL RESEARCH METHODOLOGY

The concepts were discussed in the previous chapters. The studies and the findings are heterogeneous. The competitive balance can be defined as a fan experience, a strategic objective and a research topic. Different levels of interpretation reflect on each other but still highlight different aspects of the uncertainty of outcomes. As a fan experience, it has more preferences. As a sports business phenomenon, the developmental pathway is different across continents. As a research topic, it has more approaches such as economic or statistical. Concisely, the concept and interpretation of competitive balance are diverse and fluid. In this chapter, the scope of the study will be clearly defined. The academic and methodological approach will be tailored to align with the specified scope. Eventually, in the next chapter, the strategies for competitive balances will be discussed based on the scope and using the assigned methodology.

1. Standard deviation

Although the initial studies considered competitive balance a market share issue, in this study, another approach is focused. In a statistical sense, the observation of competitive balance is an inequality study. It arithmetically examines how concentrated or, on the contrary, how dispersed the members in a population – in our case, the teams in a league. To accurately understand competitive balance as a statistical phenomenon, and because several statistical vocabularies exist, the terms used in this study will be defined in the following.

A research object has several components and, in a fortunate situation, a lot of objective and quantitative information is available and applicable to the research topic. For example, the league standings contain the number of won, drawn and lost games, goals scored and conceded, and points or winning percentage of the teams. In statistical language, these are called variables or even dimensions. In each dimension, each team has a value that forms an arithmetic sequence. For example, in the 2023/24 season of the Premier League, the ordered data series of league points is as follows:

$$\{ 91 \mid 89 \mid 82 \mid 68 \mid \dots \mid 32 \mid 26 \mid 24 \mid 16 \}$$

Although in some interpretations, the terms data set and data series are interchangeable, in this study, conservatively, the series of values belonging to a dimension is the data series, and several or more data series constitute a data set. Every data series has minimum and maximum values, several types of central values (mean or average, median, mode), as well as the distances measured from them. These metrics describe the population, its central tendency, density, or other attributes.

The primary statistical measure to express this density is the standard deviation. The essence can be succinctly described. A dimension will be selected that adequately characterizes the population – for example a performance indicator of the teams. Each element has a value along the dimension, and they have a common mean value that represents the population. The standard deviation (σ) is the absolute distance of each element (x_i) from the mean (μ) summed and divided by the number of elements (N):

$$\sigma = \sqrt{\frac{\sum(x_i - \mu)^2}{N}}$$

In other words. The average is a point, the distance between the lowest value and the highest value is the range, and the standard deviation expresses how densely the elements are spread in this range. As a practical example, in the Premier League in 2023/24, Sheffield United was the last team with 16 points. This value starts the range. Manchester City won the league with 91 points, which value finish the range. The average achievement of all teams is 52.9 points, roughly halfway between the first and last teams. It is an abstraction. As they say, the average is not the individual. No team will have 52.9 points because league points are integer numbers. So, the average is just a reference point assigning some kind of theoretical gravity center of the championship. The standard deviation, which expresses the density, is 19.72. The meaning of this is already more abstract. What exactly this number means will be explained later. First, it is more important to review what possible indicators can or should be used to measure the competitive balance.

1.1. Winning percentage

To measure the competitive balance, most commonly, the winning percentage is used. Other optional indicators can also be taken into account, but these will be discussed later. The winning percentage is a reasonable choice, and in general, the percentage-based overall performance metrics are highly preferred. By that, the percentage value belonging to members in a population (in our case, teams in a league) will always fall between 0 and 1, it provides high comparability between the competitions. The Boston Celtics was the best team in the NBA regular season in 2023/24 with a 0.780 victory rate. Real Madrid won 79.4% of the games in the EuroLeague. The percentages clearly show that both teams dominated their leagues with a similar performance. In contrast, Bayer Leverkusen won the Bundesliga with 90 points. Manchester City collected 91 points and got the best in the Premier League. Do the two performances seem similar? The German football league is smaller, Leverkusen played four less matches. Manchester City collected the 79.8% of the potential maximum 114 points, Bayer 04 Leverkusen gained the 88.2% of the maximum 102 points. The

German champion's performance was out of this world in 2023/24. The examples show how percentage-based, in a broader sense, the normalized values provide better comparability.

Besides the advantages of the percentage-based indicators, it may result in a loss of information on the research object. For the winning percentage, just the wins are considered, and thus the outcome of a game is quantified in a very simple way: 0 (not won) and 1 (won). Actually, it is a binomial variable. Based on the winner-takes-all principle, one team always gets 1 point, and the other always gets zero. Consequently, the overall average of the winner percentage on the level of the league will always be 0.500. Based on this, the formula for the metric of competitive balance based on the winning percentage ($WPct$) is:

$$\sigma_{WPct} = \sqrt{\frac{\sum(WPct_i - 0.500)^2}{N}}$$

Concisely, the percentage-based or any normalized metrics ensure comparability. However, another expectation of scientific metrics, and maybe it is more important, is to operationalize and make the research subject measurable without information loss. How the winning percentage metric is created, handling the outcome of games as a dichotomous variable (0 or 1) damages the comparability. Traditionally, the sports differ in the rules for how the team receives the competition points after a win, extra-time win, draw, or even extra-time loss. The winning percentage ignores these details (Leeds at all, 2023).

Due to the fact that competitive balance historically is an American business purpose, the research method was tailored to traditional major league sports where there is no tie. To be more precise, tie games were not officially counted in the standings until 1972 in the NFL, and nowadays, it is possible but the chance is very slim. It happens once a season, less than 0.4% of the regular season games. In other American major sports, the winner of the match is always determined. In basketball and baseball, if a game is tied in the regular time, the teams play overtime periods or extra innings. In ice hockey, the ties were replaced by overtime with an excitement factor. It can be finished with a goal ('sudden death'), otherwise, after the first overtime, the winner will be decided with a shoot-out. Concisely, in American major sports, the tie does not exist, or chances are very reduced, so the winning percentage is not distorted. In contrast, in European football, the number of draws is significant. The draws cannot be ignored (Table 9 in the Annex).

The draw is an enemy of the sports business in the American attitude. Football thinking is a little different, because basically the problem is not with the draw, but with the few goals. If a team attacks too intensively, the defense is in a high line to support the offense, the structure of the back line will be loose, and the overcommitted attack makes the team exposed to quick counterattacks.

Avoiding the risk, the teams preferred the defensive tactics, and it led to an excessively high rate of draws. To promote an offensive mindset, the three-points-for-a-win rule we know today was introduced in the Premier League in 1981. While the draw rate was 29.58% in the three seasons before the new pointing concept, it reduced to 25.25% in the following three seasons.

Another attempt to break the "peaceful draws" was introduced in Hungary in 1988 after its rate was 31.39% in the three previous seasons. The winner was defined by a penalty shoot-out following a tied match without extra time. The regulation time win was worth three points, the shoot-out winner received two points and the loser got one point. The effect was drastic. In the first season, the rate of draws in regular time flopped to 13.75 percent. The teams tried to avoid the penalty shoot-out like the plague. Not unreasonably. The team that would have been champions in the previous traditional pointing system was only fourth in the league because they lost the penalty shootouts. It is a sad fact that this system only lasted one year. Probably because the average goal per match did not change, so in that sense it did not strengthen the offensive mindset. Since the following season, the three-point-for-win rule was applied.

1.2. Point percentage

For the competition where the winning percentage would cause a significant distortion because of the draws, the point percentage ($PPct$) can express team performance. Even if not directly but in a processed way, it is put in comparison with the American and European leagues. While the winning percentage is unified indicator, the point percentage depends on the pointing concept of the sport or league (Table 10 in the Annex). For example, in football, three points are awarded for a win, while the teams receive 1-1 point for a draw. So, a match has no fixed value, it can be worth three or two points. Currently, in the NHL, the winner always gets two points, but after an overtime loss, a consolation point is awarded. After 1999, it spread in European ice hockey that the fixed value of the match is three points, an overtime win is worth two points, and one point after an overtime loss. This concept was adapted in the Polish handball championship in 2015.

The weighting-consolating pointing concepts change the statistical characters of data series even if they are normalized in point percentage. The average winning percentage in the entire season is always 0.500 as a constant. For example, in football, the average point percentage is floating because of the number of draws: in the Premier League 0.464, in the Bundesliga 0.456 in the season 2023/24. So, the formula of the competitive balance comes back to the original standard deviation formula:

$$\sigma_{PPct} = \sqrt{\frac{\sum(PPct_i - \overline{PPct})^2}{N}}$$

The research custom of holding the competitive balance metrics made of winning percentage and the standard deviation of point percentage in a comparison (Scully and Leeds), is a little bit like comparing apples to oranges. The two data series are doubtlessly similar, both range from 0 to 1, and the average is close to 0.5, but the differences are much greater under the peel. The winning percentage is the operationalization of the winner-takes-all approach to a binomial variable, the pointing system reflects better the performance details and is transformed to interval (or quasi-interval) variable. Pitting the winning percentage against the point percentage, practically replacing the winning percentage with the point percentage, where the winning percentage would be distorted, is highly questionable. Later, a few examples will try to show how much the winning percentage and the point percentage can differ.

1.3. Shared percentage

Nowadays, the game performance is rewarded in very different ways. This diversity is the result of meeting business needs such as offensive play or cathartic overtime instead of ties. However, traditionally, the most sports split a fixed match value into two parts. Ice hockey both in North America and Europe applied the two-fixed-pointing system with ties similar to football. The win was worth two points, and both teams received one point for a draw: 2–0, 1–1 or 0–2. In normalized form, 1–0, 0.5–0.5 or 0–1. After ice hockey eliminated the ties, the three-fixed-pointing system was introduced in Europe, which can be adapted into an alternative winning percentage too. To avoid confusing terms, it is called shared percentage in this study. The value of the overtime win can be placed at $2/3$, the draw is 0.500, and the overtime loss would be worth $1/3$. Consequently, five potential values exist:

$$0 \mid {}^{1}/_{3} \mid {}^{1}/_{2} \mid {}^{2}/_{3} \mid 1$$

The share percentage makes the sports comparable If a football team wins half of its matches and draws the other half, then it will be $0.5 \times 1 + 0.5 \times 1/2 = 0.75$. If a basketball team has victories 12, 2 overtime wins and 6 lost games, then it will be $0.6 \times 1 + 0.1 \times 2/3 = 0.67$. Consequently, the shared percentage expresses better the game details, in contrast to a binomial winning percentage where the game value will be at the starting or ending point of the scale (0 or 1), or in contrast to pointing percentage which is distorted by the different sports pointing system. The table below shows the significant difference between the winning percentage, point percentage, and shared percentage ($SPct$) and how they can cause three different rankings of teams.

Table 1 – Winning, point and shared percentages in NHL in 2023/24

team	league	WPct	PPct	SPct
Dallas Stars	NHL	0.634	0.689	0.622
Carolina Hurricanes	NHL	0.634	0.677	0.630

By replacing the weighted pointing of football to measuring on a normalized scale, then the gaps have widened and show better realistic value of team performances. All sports become more comparable, which will lead to a more stable competitive balance metric. Sometimes, there are just nuanced differences, but these seemingly small differences can grow more significant in standard deviation as competitive balance metric of a league.

Table 2 – Winning, point and shared percentages in 2023/24

team	league	WPct	PPct	SPct
Boston Celtics	NBA	0.780		0.780
Real Madrid	EL	0.794		0.794
Manchester City	PL		0.798	0.829
Bayer 04 Leverkusen	Bl		0.882	0.912

Using winning percentage or point percentage, both make sense in their own situations. Football fans see points on the standing and will judge how balanced the league is based on the points. Basketball or other American major sports fans focus on the number of victories. The alternative solution merely tries to solve the difficulties in comparing sports and leagues with different pointing rules. Finding or creating the right methodology for research is always a challenge. Metrics must meet a number of requirements: ensure comparability, operationalize reality without information loss, and the result should be easy to interpret and understand.

1.4. Statistical comparison of the percentage-based metrics

The table below shows three competitive balance metrics for each league selected as research objects. Despite the competitions being comparable, the differences between leagues will be explained in another chapter, considering the sports operational and sports business structures of the league, as well as strategic and league managerial decisions. In this part, the main focus is on the advantages and barriers of the different bases: winning percentage (WPct), point percentage (PPct), shared percentage (SPct).

Table 3 – Competitive balance on different base in 2023/24

Competition	WPct | PPct	SPct
MLB	0.076	0.073
Ekstraklasa	0.102	0.100
NHL	0.106	0.102
MLS	0.119	0.121
Ligue 1	0.134	0.136
Serie A	0.160	0.156
EuroLeague	0.159	0.158
Süper Lig	0.166	0.158
NFL	0.159	0.159
NBA	0.161	0.160
La Liga	0.174	0.167
Premier League	0.173	0.171
Bundesliga	0.179	0.171
WNBA	0.199	0.197

The purpose of this study is to compare different leagues, and the ultimate goal is to identify the regulatory and strategic differences that league governing bodies make to achieve competitive balance. It is important to find the appropriate methodological basis that can realistically represent the differences between the leagues with numbers. It is important to find a metric that ensures the greatest comparability. Precisely for this reason, the use of winning percentage and point percentage in the same pool is rejected, in contrast to other researches (Leeds et al, 2023). They are actually two separate metrics, one tailored to American major sports and the other to football. Due to football's weighted pointing system, the two metrics cannot be convertible and comparable.

The shared percentage is free from weighting, and it places the sports onto the same platform regardless of draw or tie, or whether the winner is decided in overtime, extra time, extra innings or a shootout. It can be seen that the shared percentage gives a similar result to the traditionally used winning percentage for the American major sports. However, in the case of European football or ice hockey, we can observe clear distinctions between the shared percentage and the weighted point percentage. For better comparability with other sports, ignoring the pointing system that encourages attacking play is much more reasonable, and applying the shared percentage makes sense. Naturally, this data manipulation is debatable since the topic of competitive balance started with the fan experience, and the fans watch points on the league table. However, it is definitely the most useful from a researcher aspect.

As the purpose of this study is to compare different leagues, and the ultimate goal is to identify the regulatory and strategic differences that league governing bodies make to achieve competitive balance, for this purpose the competitive balance indicator based on shared percentage is used by default. In some situations, the goals or scores as a match or game performance will be aggregated to observe the competitions, but this is the rarer case.

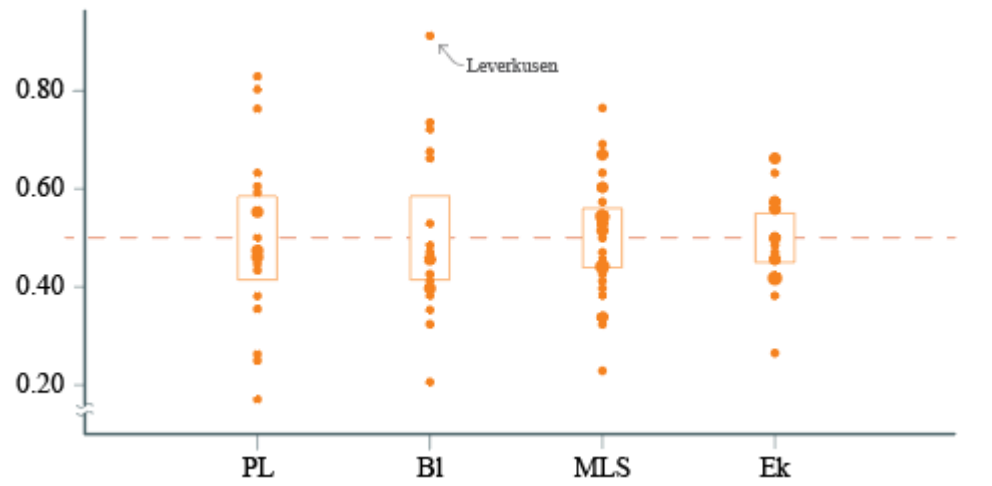
2. Dispersion

The dispersion is the collection of descriptive statistical metrics to characterize how elements are located in a population. In the case of competitive balance, the elements are the teams in a league. The above-discussed standard deviation is the most common metric to express greater or lesser distances of elements from each other. However, a few authors provide detailed descriptive statistics with minimum and maximum values. This approach, in which the statistical position of elements in a population can be characterized through the limit values in addition to central tendencies, is welcomed.

2.1. Range and spread

The figure below shows the competition performance of teams interpreting in shared percentages of 0 to 1. The horizontal dashed line indicates the average, which, due to its logic and definition above, will always be 0.500. The vertical arrangement of the orange discs indicates the team performances. The weakest team is placed at the bottom, and the champion finishes the queue on the top. In other words, as invisible lines run between the lowest and the highest value, it indicates the range of the league.

Figure 2 – Spread of Premier League, Bundesliga, Ekstraklasa in 2023/24 and Major League Soccer in 2024 based on shared percentage



The rectangles in the middle represent abstractly the standard deviation as the metric of the competitive balance. It can be clearly seen at first sight that the length of range and standard deviation are correlated in the comparison of the three European football leagues and Major League Soccer. At the same time, the figure also clearly illustrates that the standard deviation does not harmonize with the variability of the data series. The competitive balance metric of Premier League and Bundesliga have the same value (0.171) but the length and position of the scoreline is different. The English competition is symmetrical. Bundesliga tend to the top, and it seems the weaker teams are closer to the average, and the better teams stretch the scoreline up. The arrangement of the teams in Major League Soccer is roughly symmetrical too, but because the scoreline is shorter, the standard deviation will be smaller than in the top European leagues like the Premier League or Bundesliga. And lastly, the range of the Polish championship is shortest, and in contrast to the Bundesliga, it is trailed to the bottom, so Ekstraklasa seems to be more concentrated among the better teams.

Although the shorter range implies a lower standard deviation, it carries other useful information about a population. Besides the length, the position of the range on the scale is revealing. The nature of the asymmetry lets us make an assumption, but it is too early to draw conclusions. The arrangement of the elements of population provides more information visually. In the figure above, data points are located on the range and each represents one or more teams. Where the circle is larger, there are more teams with the same performance value. Where the points are located more densely, they are called cluster. Points that are further away from these packs mean exceptionally good or poor performance.

It is important to observe, in every competition, there are sections where the teams are congested. That part is called of mid-of-the-pack. In optimal cases, their gravity point is around the average of the shared percentage. In worse cases, one or a few teams sweep the board, and the middle cluster is pushed below the average line. In every European competition, there is a group of teams behind the pack stretching the range. These teams usually bounce between the first and second divisions, and they are called yo-yo teams. Later, how permanent or temporary this phenomenon will be examined. On the other side, the outstanding performance of the top teams stretches the range too. Bayer 04 Leverkusen ran a phenomenal season, resulting in a right-leaning competitive imbalance. Seventeen-point lead is rare, twist of fate, it was done by Leverkusen, who never was champion before. In the last three decades, they finished at the second or third place eleven times, and they were tagged with the nickname “Neverkusen”.

2.2. Extreme values and symmetry

Even a single outstanding or severely underperforming team can significantly change the dispersion metrics of a small population as a championship. The MLS competitive balance indicator

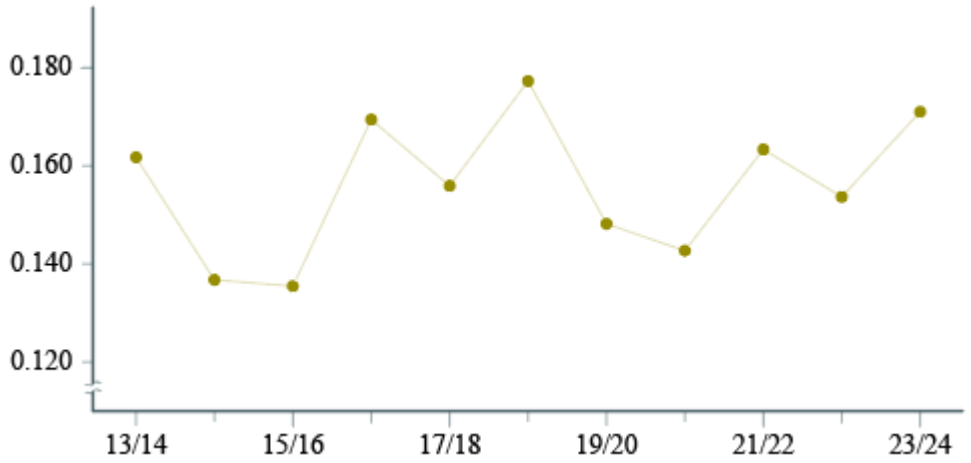
is low because the league is free from extreme values. While in a larger population or sample, an outlier value can blend in more easily in the big number of data, in a small population it will appear much more prominently. There are statistical methods of how to compensate for the effect of extreme values on the majority. However, in the case of competitive balance, a dilemma arises. Statistical methods basically aim to characterize populations with common attributes and central tendencies. In contrast, the business need behind the measurement of competitive balance is the exact opposite, focusing on those factors that distort competition, and the business strategy for balance strives to bring the extraneous values back into the fold.

The values on the edges determine the length and position of the range. The perfect symmetry of the Premier League in 2023/24 resulted at random. Manchester City's performance harmonizes with the champions in the last decades, but at the bottom end of the range, the league's whipping boys with the fewest points in the last five seasons. The general tendency is that the Premier League is top-heavy. The relegated teams stand closer to the average signed with a red dashed line, and the top teams are further away. The distance between the first and last-placed team in a competition can be quite variable season-by-season (Figure 20 in the Annex). Considering, the range and the standard deviation are correlated, if the former is bounced by the extreme values, so will the latter. The statistical fact is that the value of competitive balance is unstable.

2.3. Swing and average line

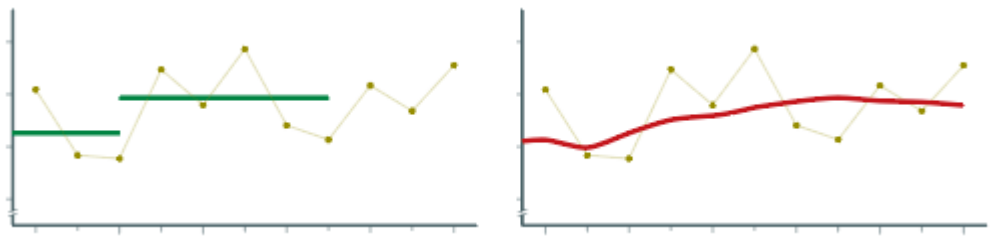
In the European top leagues, it happens relatively often, a team wins the championship by a landslide. As a fan experience, this can be described as a team clinching the title four or five games before the last round. In a statistical sense, it means a 15 or larger percentage-point advantage, and probably the performance is above 85 percent. Although it is much less regarded, the vast majority of fans watch the champion-aspiring teams, the extreme values also periodically appear at the end of the top football leagues, when a team achieves a result of only around 20 percent or worse. Both outstanding results, as a top or bottom extreme values, will influence the competitive balance metric significantly. In the example below, it can be seen how the value of competitive balance swings in zig-zags over a longer period in the Premier League. The serious variability can be recognized relatively easily in the below figure about the Premier League. In the most competitive season in this period, in 2015/16, two miracles happened. One was that Claudio Ranieri made a masterclass in his first season with Leicester City. The other was all of the Big Six teams' disappointing underperformance. In 2018/19, where the standard deviation of the shared percentage is the highest, the champion race was an outstanding duel. Finally, Manchester City won with 98 points, just a hair one-point advance in front of Liverpool. However, the third-placed Chelsea lagged by 18 points. Actually, this advantage is not an unusual fan experience recently. The tight champion race is rarer.

Figure 3 – Swing of competitive balance based on shared percentage in Premier League in the last eleven season



The fluctuating performance of teams leaves an impression on the competitive balance metric even in a league that is increasingly suffering from the dominance of big teams. The main lesson from the above figure is that comparing different competitions in a given season does not deliver valid results because of the sensitive sports performance. Studies that recognize that longer periods are needed to compare leagues, avoiding the misleading nature of oscillation, usually work with five-year or decade periods. In practice, the timeline is segmented, and the competitive balance metric is aggregated from the sports performance of the teams in all seasons in the segment. In the below figure, it is the horizontal lines with green color. The other and more smoothie solution is the rolling or moving average. A value is assigned to each season, but it does not refer to just the given year but to the average of preceding five years. It is illustrated by red color.

Figure 4 – Periodic and moving average of competitive balance based on shared percentage in Premier League in the last eleven season



The advantage of the moving average is that the observation will be neither sectioned nor chunky. It indicates a long-term tendency of the zig-zag values. Choosing the optimal length of time interval of moving average is basically a logical decision. Time series data often oscillate. The reason in the background can be a cyclical change of environmental factors or simply a probability factor. For example, the national economic is seasonal, the cyclicity is revealed, and ultimately the data are statistically compensated. In contrast, in sports, the conditions are more hectic leading to a broader

data swing. As many competitions as many patterns. It would be hard to discover a controllable factor. Simply, in sports, the probability, the luck and the random factors have a significant effect. There is no single cyclical pattern in the changes in sports performance data. For observation in sports business, the ten, five or even three-year periods can be valid. A strategic decision needs time to have an impact. Often, it generates fundamental changes, and clubs are allowed to take time for preparation and adjustment in a transitional period. Considering this idea, in this study, the five-season aggregate data is preferred.

Consequently, the above examples spotlight how competitive balance is such a sensitive phenomenon. For a valid conclusion, a bigger data set of more years should be observed. In this study, the five-season period will be the default. By smoothing out the fluctuations resulting from the luck component of the sport the long-term trends become much more apparent. If strategies have an impact on the competitive balance metric, this change will be easier to detect. In addition, in the next chapter, another approach will be emphasized focusing on the elements outside of central tendencies much more. Basically, every competitive balance strategy aims to reduce the lag of teams at a disadvantage.

3. Distribution

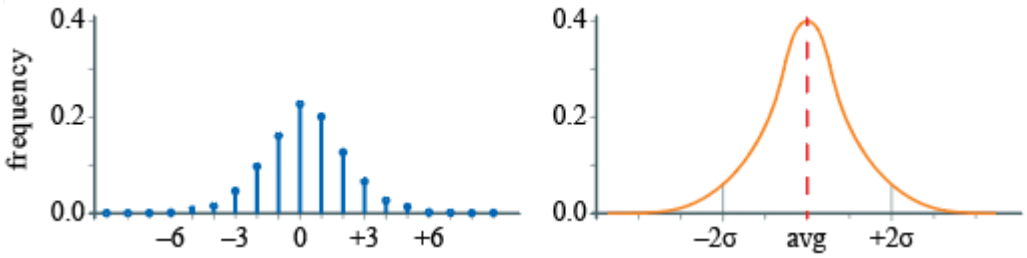
The distribution is an aggregating statistical method. While in the dispersion, the population is characterized by descriptive statistical metrics such as minimum value, maximum value, average or standard deviation, the distribution is based on the frequency of potential values referring to the population members. For example, when Fransisco Montes examined the matches in La Liga and summarized how many home wins, draws, and away wins happened, then it is a basic frequency based on three optional outcomes. In this case, the population consists of matches and not teams. The match outcome can be broken down into goal differences, showing the frequencies in the Premier League over the past five seasons (Table 11 in the Annex).

3.1. Histogram and smoothed curve

Fortunately, distribution can be easily illustrated. The optional values are listed on the horizontal x-axis in the chart. The vertical y-axis is the frequency. Sometimes, it shows absolute values, for example, how many three-goal away victories happened. Most commonly, the frequency is written in normalized form between 0 and 1, which can mean theoretic or expected probabilities or experienced or observed percentages. In visualization, there are two types of frequency graphs: trendline and histogram. The figure below shows two ways of representing the same phenomenon: match goal difference. The differences in visualization are emphasized sharply to make the two views easier to understand.

The columns on the left side are lower than the peak of bell curve on the right side. It is caused by the difference in scale units. The left histogram shows 19 potential values of goal difference following the previous table, while the right chart shows ten bins. Obviously, if a population is divided into less section, the proportion of each will be higher. The left chart is is the simple way to illustrate the outcome of the matches. The minus goal difference means the away victories, and the positive value represents the home wins. Most matches are drawn. As the goal difference increases, their proportion decreases. There is a natural asymmetry in the distribution with more home wins than away victories. This slight shift to the right is a home field advantage.

Figure 5 – Statistical histogram and distribution reference of match goal difference in Premier League in the last five seasons

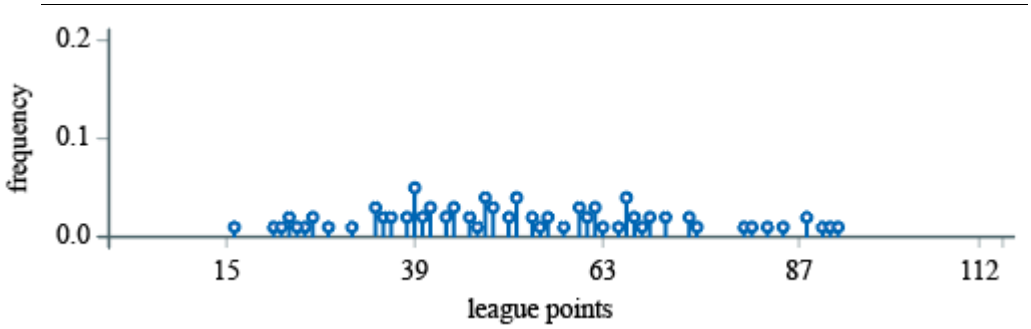


Although the two charts illustrate the the same population, on the right side the bell curve is not just higher but symmetric. The graph reflects a statistical approach. The central starting point is the average (0.25) and the scale unit is the standard deviation (1.96 – roughly two goals). Consequently, the chart on the right is scaled like a continuous variable. The ticks only indicate abstract reference points, not real values. In reality, 0.25 and 1.96 goals do not exist. In contrast to blue columns in histogram of discrete values: –9, –8, –7 and so on, the orange smoothed curve is just a trend line. If a random point is selected on the line, a real value of proportion cannot be found there. It merely symbolizes the distribution. The members of a population are spread in the area under the reference line. This representation mode, on the right side with the orange-colored smoothed curve, will have a role in probability calculation which will be discussed later.

3.2. Sporadic records and bins

The example above with goal difference is one of the easier situations. The aggregated data comes from 1900 matches over five seasons. There are nineteen observed values, nine of which have visible frequencies. So, 1900 unique data points are merged along 19 scale units. A statistically perfect situation. Oppositely, the examination of the teams based on the league table is difficult. Considering five seasons of the Premier League with 20 teams, 100 unique data points will be distributed on a scale of 0 to 114 points.

Figure 6 – Statistical histogram of teams based on league points in Premier League in the last five seasons



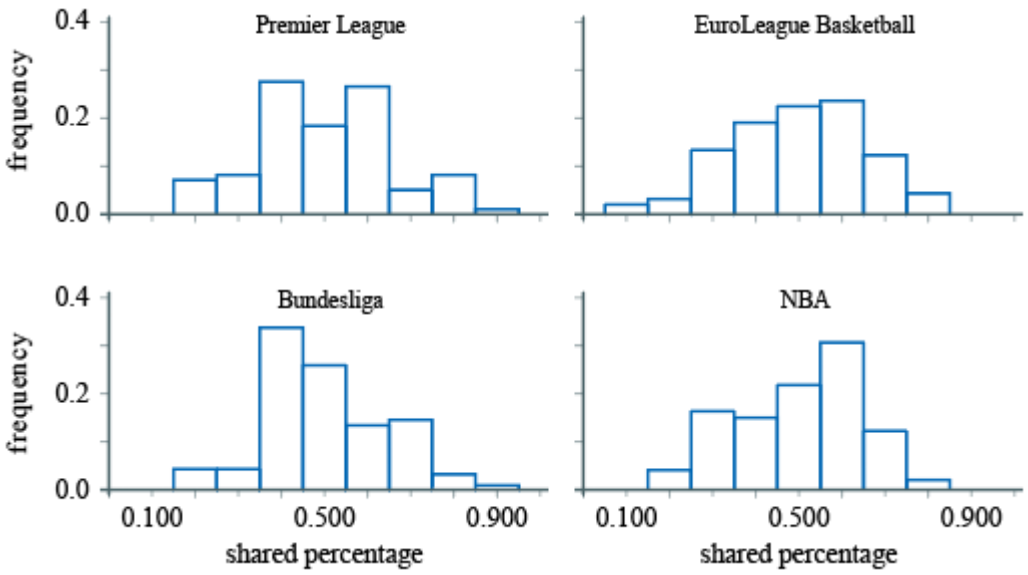
With fewer records and more potential value, the chart would be fragmented. To solve this data visualization difficulty, bins are applied. For example, the data records can be grouped by twelve league points (Figure 21 in the Annex). Bins are usually not measured from zero. According to central tendency, the traditional statistical approach prefers the middle bins next to the average line. The social science approach, however, emphasize a separated category for values around the mean.

3.3. Discrete and normalized values

The different leagues are not comparable due to the different competition systems on the same scale. In the distribution figures, the x-axis is the range of potential values. The end value of the range, the available maximum point depends on how many teams and how many rounds are played in the league. In the Premier League, the maximum available is 114 points, in the Bundesliga there are two fewer teams and four fewer matches, so the maximum points that can be obtained will only be 102. When Bayern Munich won the championship 10 times in a row, the average lead was 11.1 points. It is equivalent to 12.4 points in the English, Spanish or Italian leagues. Expressed as a percentage, it is 10.8. The percentage is well preferred in economics. Statistically the normalized value between 0 and 1 is the common. Although discrete integer values are typical for sports, for statistical comparison, it is worth using continuous and normalized variables.

In other leagues, especially in major American sports, the team performance is interpreted in percentage in the standings. Mostly, the winning percentage is used for ranking, and sometimes the point percentage. As discussed in the previous chapter, to compare different sports and leagues, a measurement method is needed that can uniformly handle game and league outcomes. The shared percentage created in this study is similar to the winning percentage. The value of each match is considered as a unit of 1, but in contrast to the winner-take-all principle, in the share percentage, the teams divide the match value depending on their on-field performance. See the definition in the section of *1.3 Shared percentage* in chapter of *Empirical Research Methodology*. The total share percentage achieved by teams can also be expressed as a normalized value. The scale of potential values lay between 0 and 1.

Figure 7 – Distribution bins of teams based on shared percentage in in the last five seasons



The advantage of data visualization is that the figures can illustrate more complex phenomena, making the research topic more comprehensive. The four competitions above demonstrate four different arrangements despite being similar in competitive balance metric based on standard deviation: Premier League 0.156, EuroLeague 0.150, Bundesliga 0.147, and NBA 0.141. In the English football league, a mid-depth probably implies a stratification break point. The distribution of EuroLeague Basketball is the shortest but widest. The Bundesliga is an almost perfect mirror image of the NBA. Overall, the figures carry more information. Besides, the leagues can be compared, or even the observed and expected state, such as the perfect competitive balance.

4. The perfect competitive balance and an alternative methodology

The definition of perfect competitive balance is worth deriving from the game uncertainty. In this situation, the fans do not know what to expect. Naturally, the local fans will be biased and will emphasize the qualities that make their victory expected. However, apart from that, a situation should be imagined in which there is no difference between the teams. The ability of players and coaches is the same. The tactics neutralize each other. The home advantage does not matter. Even the referee officiated the match perfectly. It couldn't be better to express how theoretical the competitive balance is. If the conclusion from this imagined situation was every match would be a draw, it would be a mistake. The result of the match will depend on pure randomness meaning the factors that cannot be controlled. For example, a player's outstanding shape on the match day. The random factors provide the game uncertainty. The impact on the result is similar to coin flipping.

A popular example in probability theory is to simulate the binary outcomes with a coin. The sports are a little bit more complicated than a win-or-lose question, but the method can be adjusted.

Both teams get a coin. Head or tail can be designated as the winning option. The other one is the losing option. If the teams have different calls, it is simple: one of them is the winner, and the other one is the loser. If both teams call the same, it is a draw. Or how it happens to sports with overtime, they play on and flip again and again until the winner is not determined. In other words, the first flip symbolizes the result of the regular time. All other flips simulate the overtime and the shoot-out. Based on this concept, the probability outcomes can be defined for game uncertainty:

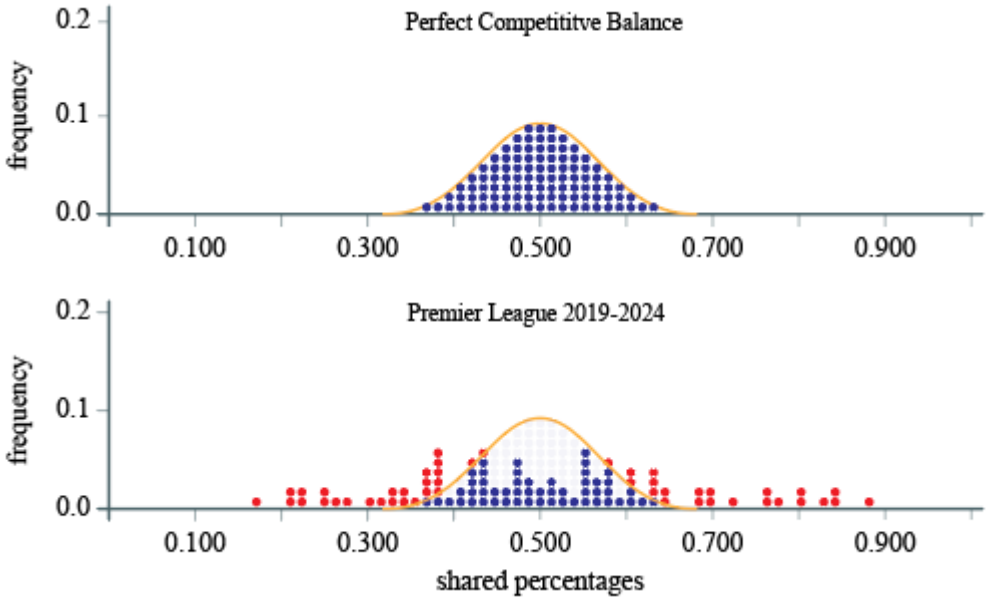
Table 4 – Probability outcomes of a game

	RW	OTW	D	OTL	RL
sports with draw	0.25		0.5		0.25
sports with overtime	0.25	0.25		0.25	0.25

Each match is a separate coin toss. Just like a league, the aggregate results of the matches determine the league ranking. For example, in 17-game National Football League, the chance for winning every game is 0.25^{17}. The last time the New England Patriots went undefeated in the regular season in 2007. In the baseball, it effectively impossible. The chance for completing an unbeaten run to the championship is 0.25^{162}. It is indescribably slim. The league distribution of perfect competitive balance is fundamentally affected by how many games a team plays in a season. In reality, however, it does not make for a more balanced league if a better and a worse team play each other six times in a season. Based on this consideration, the number of matches for calculating perfect competitive balance will be limited to two games per team per opponent, applying the traditional European approach.

The probability distribution is calculated from game uncertainty, but the rule of whether the draw is accepted in the given sport or the games are played until the win does not significantly affect. The distribution shape and metrics is almost the same (Figure 22 in the Annex). Illustrating in football the difference between probability and reality, the probability chance in a top football league to achieve a performance above 70 per cent is about 0.015 per cent. On the contrary, empirical experience in the past five seasons is that the proportion of teams in the top sphere, is 10 per cent in the Premier League. The below chart is a simplified illustration how the teams would be arranged in perfect competitive balance based on probability, and what is the reality in the English football league based on the last five seasons. The orange line is a reference if the data are not merged into bins. Each disc indicates a team. The blue colour means the teams are inside of the competitive balance zone, and the red colour is outside.

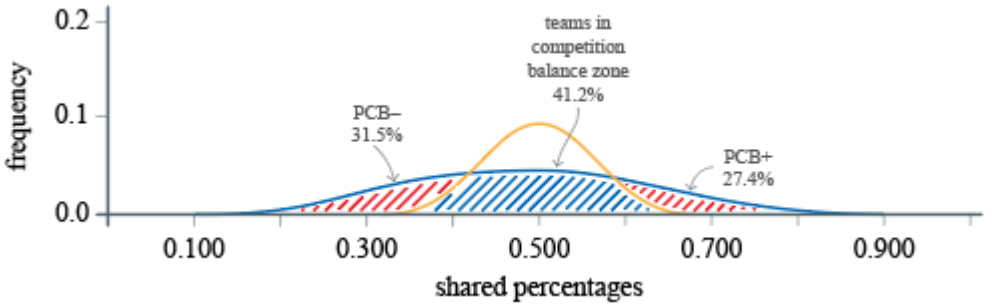
Figure 8 – Distribution of perfect competitive balance and Premier League based on shared percentage in the last five seasons



As shown in the figure above, the perfect competitive balance calculated based on game uncertainty is a broad concept. The dispersion of teams would not be on a line or in a strip around the average. The expected league uncertainty is a cone-shaped area below the orange reference line. If the bins are applied in visualization, the shape of distribution will be peakier. This middle area can accommodate a large number of teams. For example, the distribution of twenty or eighteen teams could be relatively scattered even within the perfect competitive balance zone. However, an important condition is that the difference between the weakest and the strongest teams would most likely not be more than 30-40 shared percentages. In other words, they would be concentrated in the middle third. There would be no top and small teams, only the middle of the pack. The central tendency, defined as distribution, has an area. It can be used to measure competitive imbalance. How many teams are inside the zone, and how many teams are to the left or right of the zone? This is the basis of an alternative methodological approach discussed in the next section.

As the Weberian ideal type is discussed in section of *3. Competitive balance as an ideal type* in chapter of *Literature Review*, in scientific research, tools are needed to understand the empirically observed phenomenon. Although the ideal type is abstract and does not exist in reality, as a concept, it can make the reality of the research topic pragmatically accessible. In other words, if the competitive balance as an ideal type can be statistically determined, then it serves as a reference value. The perfect competitive balance suits this function. In the chapter about traditional methodology, it was already revealed that the interpretation of competitive balance metrics struggles with challenges because guide or proper reference values, it is not possible to interpret how balanced or unbalanced the competition is. The *perfect competitive balance percentage* (*PCB%*) can be an optional solution.

Figure 9 – Distribution of perfect competitive balance and Premier League based on shared percentage in the last five seasons



In the figure above, the orange line indicates the area of perfect competitive balance. The blue line is the distribution of Premier League teams. The teams in the red-shaded area are outside of competitive balance zone. In these spots, there are more teams than expected. The area of perfect competitive balance and the observed distribution are overlapped in the blue-shaded spot. This part of the league meets the expectation. Consequently, the teams can be split into three parts: under (left side), inside or above (right side) the perfect competitive balance. Each area can be measured. How many of the league is in the section?

Practically, it is mathematical mechanism. In the first step, to determine the potential value of sports performance. Although, the aggregated shared percentage (or any percentage) is a decimal number, as a variable it is not continuous. It can take on a certain number of possible values depending on how many teams play how many matches in the league. In this sense, it is a discrete variable. A probability belongs to each shared percentage value, according to perfect competitive balance. The observed proportion of the teams in the league can be compared to probability calculated row-by-row (Table 12 in the Annex).

The overlap value cannot be greater than the observed proportion of the league in the given period. Basically, there are two possible cases. If the observed value in a row is greater than the probability, then the latter is the value of overlap. For example, at 0.381579 shared percentage of performance, the expectation is one team (~0.01%) based on perfect competitive balance. In fact, six teams achieved this result in the previous five seasons. So, five of these teams are outside the zone, and a single will be inside. This point can be identified in Figure 8 above. The other case is that more teams are expected in the middle of the table, but fewer teams correspond to this. Typically, this is seen between 0.394737 and 0.618421. The blue area or discs in the above figures.

The sum of these overlaps is the PCB of Premier League: 41.2 per cent. This is a decisive metric, but it is also possible to calculate how many teams, or formulated in a more precise way, how big part of the league will be below or above expectations. In other words, the league will skew to left or right. The weak teams pull the field to the left: 31.5. The strong teams cause gravity to the right: 27.4. Focusing on the football leagues, the English and American competitions stand out from

other championships. However, the strategic reasons behind this phenomenon are completely different. On the first hand, it reflects the continental differences well; on the second hand, it implies the effectiveness of a strategy is not defined by approach.

Table 5 – Perfect competitive balance based on the last five season

SPct	PCB–	PCB	PCB+
MLB	25.6	49.1	25.3
NFL	26.4	44.7	28.9
MLS	25.1	42.3	32.6
Premier League	31.5	41.2	27.4
Ekstraklasa	27.6	38.6	22.9
NHL	29.7	37.8	32.5
La Liga	37.8	36.9	25.3
Bundesliga	34.8	36.8	28.4
Süper Lig	38.0	36.6	25.3
Serie A	35.5	32.9	31.6
Euroleague Basketball	34.7	32.2	33.1
WNBA	35.4	31.6	33.0
NBA	31.8	29.2	39.0

The advantage of the perfect competitive balance metric is that it provides information about the gravity of competition. Actually, it is the skewness of the statistical distribution. If there are more teams to the left of the middle section, it means that the underperforming teams dominate the league. This is a characteristic feature of most European football leagues. If there are more teams to the right of the perfect competitive balance zone, it shows that the league is overconcentrated. This is characteristic of most American major leagues, causing a higher uncertainty in the race for the championship title.

III. RESEARCH RESULTS AND DISCUSSION

The aim of this study is to identify those strategies that significantly influence competitive balance. In the American sports market, uncertainty of outcome is a fundamental objective. So, in this case, the achievement is expected. In the European sports market, the objective is to provide financial stability, but these strategies can also have an impact on competitive balance. Both cases can be observed with the breakpoint method. The competitive balance trend is diverted by the effect of proper strategies.

Three categories of strategies will be distinguished. The first is sports operational decisions. Although in Europe, the competition system is traditionally not motivated by business goals, this has now changed. The size of the championship and the number of matches have a serious impact on broadcasting revenues. A managerial dilemma is whether more championship rounds or the quality of the matches are important. The second category examined is the player labour market as a determining factor in sports performance. The leagues' efforts are aimed at creating teams with similar abilities. Finally, the third category includes those strategies that intervene in market conditions on the revenue side to reduce the differences between large and small teams.

1. Sports operational decisions

Traditionally, we separate sports operations and sports business. In this study, this distinction is handed as a definition of two types of attitudes that influence the operation of leagues and the sports market. Probably, the sports market in Europe is regarded as born when the transactions of resources intensify and the business mentality appears. This mechanism practically happened when the professionalization stepped into the sports. In some places, it has developed into commercialization. So, the management of resources, such as paying players, or the mentality that sports create a sellable product for income, changes the way how European sports operated originally.

The sports operations and sports business are not two antagonistic values of a dichotomous variable. Leagues cannot be divided into two groups, sports operational organization or sports business entity. Although a sharp difference can be discovered continentally, according to which the American major leagues were organized on a business basis, while in Europe sport was more of a socio-cultural phenomenon. However, the world is not a constant. As time has gone on, more and more business elements have been incorporated into the European sports model as well. So, this is what we can actually consider the evolution of the sport.

The emergence of sports business aspects does not eliminate sports operational matters. Determining the number of teams in the league and defining the competition system was, is and will be a basic operation task. However, it is important to see that when business interests appear, these

cases are refraction in a different light. The governing bodies of the leagues are faced with a managerial dilemma, and they should balance the earlier club interests against new business aspects. While traditional league operation decisions were affected by an expenditure-focus aspect of the clubs, such as the optimization of travel costs, in the sports business mentality, the games are replications of the sports product. So, more matches no longer mean more costs, but more revenue. Conditionally, if the sports business runs properly.

1.1. The appearance of business mentality in European league decisions

Presenting how sports operations absorb business thinking, briefly, the evolution of European continental competitions will be reviewed, focusing on the mainstream. The teams played duels in the knocking-out system with the final at the end. This practically determined the number of teams in powers of two. In the next step, each country could send a team, but depending on their strength, everyone joined the bracket at a different point. There were pre-qualifiers, qualifiers before the best 8 or 16 field was formed depending on sports. The next point in development was induced when a part of the knockout stage was replaced by a group stage for fairer ranking. In European basketball, it was applied from the beginning: winners of groups were qualified into the best eight. Since 1965, also the best teams took part in round-robin groups before the final four, and it was extended gradually to a league competition. The European football changed slower and much later.

The group stage was introduced in the top-tier European football cup in 1991. The competition was rebranded to Champions League one year later. The group stage of the top eight teams could only be reached through qualifying matches. English champions Arsenal, for example, were eliminated, but Italian champions Sampdoria could only thank the goalkeeper Gianluca Pagliuca's heroic save for not losing to the much weaker Hungarian champions. French champions and finalist in the previous season, Marseille was also eliminated by Sparta Praha, and German champions Kaiserslautern by Barcelona. Yugoslav champions Crvena Zvezda, on the other hand, stepped over the Northern Irish and Cypriot champions to reach the group stage. In the next year, the winner, Barcelona, was eliminated in the qualification by CSKA Moscow who did not win a single game later. Consequently, the draw-based elimination system was neither fair nor commercially advantageous for the group stage without English, Spanish, German and French teams. However, the uncertainty of the league outcome was quite high. Practically, every season deliver a new winner in the Champions League (or its predecessor, the European Cup). Back-to-back title defenses were rare.

In 1994, the group stage was expanded to 16 teams, with secured places for the eight strongest European domestic championships. This decision clearly reflected business intent. More matches and more viewing figures meant more broadcasting revenue. Although, if the business interest were considered, the winner of Ligue 1 would have been guaranteed in the group stage. The

Portugal, Belgian and Dutch competition was more esteemed. Three years later, the strongest football nations could qualify two teams. A few years later, even more, based on the introduced coefficient system. On this path, the UEFA Champions League expanded into a double-group stage competition system, including the 32 best (or qualified) teams.

How did it not become like an American major league? The business approach only appeared in the organization of European competitions, but it did not drive them. The European Super League (ESL) was an initiative similar to the American major leagues. The top English, Spanish and Italian clubs were motivated by finances and security to organize high-quality and intense matches. The idea was supported by the experienced decline of the competitive balance also in continental football (Braggan et al., 2021). Briefly, the ESL would have been driven by business interests. The attempt failed due to a ban by national associations and public protests. The local fans insist on the domestic championships. Ultimately, it incentivized the UEFA to introduce more effective financial rules, and reform the competition system into some kind of league system in 2024.

1.2. League expansion vs. league reduction

It is clear that the sports business approach is being integrated into sports operations. Even if the pursuit of competitive balance does not directly drive the league decisions, it can be an aspect of complex business considerations. Or at least, there is an impact on uncertainty of outcome. The European football domestic championships have always operated in a league system since the beginning. As mentioned in previous chapters, the league met the fan demand to provide better and more matches. Actually, it is a dilemma of quality and quantity. The leagues are interested in increasing the number of matches, because it results in higher broadcasting revenues. At the same time, the expansion of the league can be accompanied by the risk of dilution. On the opposite, the reduction can also be a valid business aspect. The number of matches that a television viewer can watch on a given weekend is limited. So, the loss of the weakest matches will not cause a decline in viewership. Regular experience in all European leagues that the performance of little market clubs at the end of the standing significantly lags the middle of the pack. In another name, from the perfect competitive zone. The league reduction is an emphasized topic by the top clubs participating in UEFA competitions to gain time to rest instead of four low-quality and probably unprofitable matches.

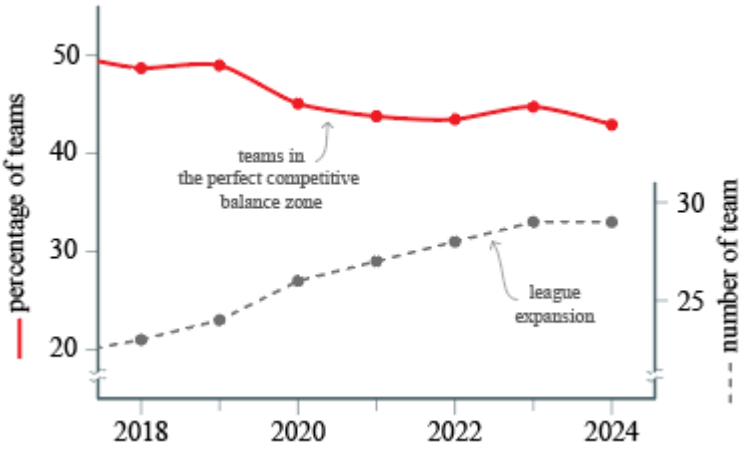
The French league reduced to 18 teams in 2022. The change is too recent, and the volatility of sports data does not allow for detecting changes in competitive balance. Although the Hungarian football championship is not part of the scope of this study because it is a small-market league, the impact of the league reduction on competitive balance is clearly positive (Figure 23 in the Annex). The Turkish Süper Lig made the opposite decision. In relegation-promotion leagues, expansion means involving teams from the second division, and it has caused further decline in competitive

balance (Figure 24 in the Annex). It seems, the Polish Ekstraklasa implemented a more careful league expansion. Two teams were added to the sixteen-team league in 2021. Despite the expectations of declined competitive balance, the league expansion stopped the negative trend, and it has already started to return to a previous level (Figure 25 in the Annex). An additional information, the Poland is a large market, but but the population density is not as disproportionate as in Western European countries. Consequently, the market environment is also balanced, which can cause a high competitive balance.

The league expansion is fueled by the hope of product multiplication. Two more teams will most likely not raise the quality, but it means four more rounds. In other words, the interesting matches will be spread over four more weekends. The revenue can be better optimized and increased. So, the league expansion is mostly not beneficial to the new small teams and is not a solidarity decision. The risk of damage to competitive balance is undoubtful, but it is considered an additional loss in exchange for the bigger television broadcasting fees for the league, and higher commercial revenue for the teams. Moreover, this new income can cover the rebalance by the appropriate revenue redistribution.

Unlike European open leagues, Major League Soccer is implementing controlled and continuous growth. An expansion aims to engage a new market where football (or other major sports) was not previously available. Consequently, it is possible to avoid quality loss. The conditions for participation in the league, which operates purely as a business enterprise, are quite thick. Besides the developments, an expansion fee is required for the right to operate a team. It is not a fixed amount, but an outcome of negotiations. For example, it was reported to be 300-325 million USD for the team in Charlotte. This amount is not a deposit. This is the price of a non-refundable ticket to ride the MLS train. In short, MLS as league creates a product. Participation in the production chain needs attract investors who can provide to operate a competitive team.

Figure 10 – League expansion effect on competitive balance in MLS



Unfortunately, the chart above shows that the distribution of teams is deteriorating in parallel with the continuous league expansion. The proportion of teams in the perfect competitive balance zone has decreased by 6 percentage points in 7 years. As mentioned above, league expansion is driven more by the hope of revenue growth. Every situation is unique, so it is not necessarily true that an expanded league will result in dilute competition. Conversely, even the most well-considered decision with hard conditions can result in a deterioration of competitive balance.

1.3. League merger

League mergers are related to market expansion. The monopolies of the American major leagues are practically due to developing cooperation. In a certain sense, in other industries, this would be called a cartel. However, the sports market is different because of the limited resources. The pool of quality players and professionals, those who are the main producers of the sports product, is very narrow. The prospering football leagues in Asia or even North America face the problem of a lack of human resources. Despite the high expansion fee in MLS, the best player cannot be available for the franchises. The skills of homegrown football players are not yet sufficient for a higher level.

Similar to Asian football leagues and MLS, also the smaller European competitions face a lack of resources, which would prompt them (or the best teams in these leagues) to merge or bind the operations. Actually, this mechanism is prohibited in European football. The UEFA does not validate regional leagues. This effectively means that teams in small-market leagues are captured. The race for limited resources pushes the smaller actors down. If all teams are forced into small domestic leagues, it means the best teams, mostly in million capitals, cannot exploit their business opportunities. Their competitiveness in European competitions will be declined. Consequently, not just domestic leagues will be distorted, but the continental competition will be imbalanced too.

European ice hockey and basketball are more permissive and innovative. In most cases, the regional leagues are symbiosis with domestic leagues. The Adriatic League practically saved the basketball league of collapsed Yugoslavia. After finishing the merged competition, the teams return to the play-offs of the domestic leagues. The league was extended with a second-tier competition in 2017. The second example, the BNXT league combines the middle phase of the Belgian and Dutch championships and splits the teams vertically into gold and silver groups. In the next step, the teams play a separate national play-off, and finally, the best Belgian and Dutch teams face in the grand final. At last, The Baltic League was a promising initiative, managed to attract Finnish and Swedish teams, as well as international sponsors. Despite the good start, finally, it had been ceased in 2018. Two potential problems can be detected related to sports operation. Too many teams were involved, in certain seasons, more the 20 teams. The best teams were not withdrawn from the domestic leagues.

2. Controlling the labour market

Every business process has bottlenecks. The shortages of resources determine the quantity and quality of products. The companies struggle to overcome obstacles and strive for better conditions. In this mechanism, companies will be better or worse. Ultimately industry will be segmented. For example, the lack of well-trained labour limits the volume of high-quality products. Some companies specialize in luxury products, paying higher salaries to the employees. The higher wages will attract other employees from other companies. A pull effect is created. The best and most-trained workforce will stream to better-paying jobs. The weaker workforce stays to make mid or low-quality products. The industry gets segmented. There will be manufacturers with higher profits per product, and there will be smaller manufacturers to produce in higher volume of lower quality.

Practically, the above mechanism happens to sports as well. With a significant difference. Every team plays the same number of games. The number of products is equal. Underperforming teams cannot earn higher revenues by playing more matches. In other words, unlike other industries, where companies have a chance to remain profitable with shoddy products in higher volume, it is less likely to happen in sports. The clubs paying the athletes higher salaries absorb the prospective players from other teams, and ultimately, they make the competition dysfunctional. The competition will be segmented by powerhouses and the teams without a chance to win. These clubs try to build another business model for survival. Concisely, they will not be competitors but suppliers.

The American major leagues recognized the danger of deterioration and introduced control on the player payroll. The salary cap is motivated by providing the competitive balance as a fundamental value. In the European sports market, fewer and softer tools arise, and not all of them are used. In the next section, the methods will be discussed, and where the purpose is to improve the uncertainty of outcome, the impact of the measures will be examined statistically.

2.1. Squad limit

The European football leagues are a socio-cultural phenomenon rather than a sports business, considering their history. Obviously, it is not black or white nowadays. It is merely turning the spotlight on the background of strategic decisions. The first intervention in the player transfer market in each league was the restriction to register foreign players. The protection of national sports was stronger than the business interest of revenue. The Bosman case brought an environmental change in 1995. The application of common rules of the European Economic Area (EEA) was demanded. The sports labour market was transformed to pan-European from national. Nowadays, the leagues can only limit the number of players coming from outside the EEA. Apart from the English football leagues after Brexit. Going back to the nineties, the pull effect that stronger clubs are able to transfer

the better players across Europe has led to a competitive imbalance in domestic leagues. In the same era, the widespread digital broadcasting and rebranded Champions League fuelled the changes. Along with how European football got commercialized, the financial cover for powerhouses like *Galácticos* or any club without impressive nicknames was provided. The appearance of foreign capital boosted the deterioration of the competitive balance, according to several papers and authors quoted in the previous chapter.

To understand the squad limit, it is worth learning in a very simplified way how the composition of the squad depends on the financial capabilities. Smaller clubs prefer at least one reliable player for every position. The transfer decisions will never be perfectly successful. A hallmark of small teams is that there are holes in the team. They will basically strive to secure their defence, and it will be less important for them to transfer a virtuous striker. As a result, small teams will perform pretty well in the rear, and they fall short of expectations in front. Some clubs are in a slightly better situation, being able to secure every line. If some positions are doubtful, they can buy more promising players. They can provide stable performance because the number of quality players in the squad exceeds eleven. As the teams are getting better, primarily, it means they have more and more reliable athletes. Although the depicted mechanism is more fluid and dynamic to define clear categories, the clubs above roughly represent the yo-yo teams and mid-of-the-pack.

Heading up in a spiral way, the clubs are on the next level being able to pay for star players in certain positions. The players on the bench have already proven to be steady performers or future stars. These teams, even if they are not fighting for the championship title, are guaranteed to be top-tier and to play in international cups. They would probably be competitive with the B team against a smaller team in the domestic league. Finally, teams at the top are packed with stars and support players. They are practically stronger than any national selection. Depending on the viewpoint, the judgement varies on whether the aspiration and player policy of the big clubs is acceptable or not. The pejorative interpretation is that top teams strive to acquire resources to eliminate their rivals. Similar to big companies in other industries. The more permissive interpretation is that teams need a thicker frame due to the dual demands of domestic and continental competition. As we will see later, there is truth in both.

The UEFA introduced squad limit restrictions in the regulation of continental competitions in 2004. So, not a separate strategic measure. It is considered sports operation regulations. The financial fair play was also introduced seven years later. Determining the maximum number of 25 players is an administrative measure. It only applied to clubs that participated in continental competitions. Some clubs were subject to the rule in a season, and not in the next. The national associations were free to decide whether to adopt and apply the regulation. The UEFA did not aim to rule the European transfer market in a centralized way. It merely made a careful step toward holding

back distortions. The effect is controversial and debatable. Although the squad limit prevented the richer clubs from taking a larger slice of the cake, these clubs could spend the same big amount for payroll. In economic terms, it induced a price-driving effect. The player flow toward to big clubs will get stronger. Concisely, the regulation stimulates concentration.

A recurring problem in the European sports market is that medium and small clubs have little opportunity to retain their key players. These players can help the on-field performance, and on the other hand, they can brand the marketing activities. What club wouldn't want icons? However, loyalty to the club passed away. Moreover, the clubs are forced to sell their outstanding player before he would be a free agent. In other words, they will accept the money, but the continuity of the performance will be broken. Ultimately, their position will be frozen in the league table. That mechanism is experienced in continental and domestic leagues.

The European sports market also differs significantly from North America in that major sports franchises are not expected to develop players. The best players are also lured into the league with impressive salaries. Actually, it is a pure sports business mechanism. With the emergence of foreign capital, more and more European clubs tried to embark on this path. However, the responsibility for player development is a European tradition. This approach is reflected in several regulations. The squad limit rule determines the number of home-grown players over 21 years old. Initially, that was four, since 2008, it is eight. So, the UEFA put an obstacle in the way of buying unlimited well-trained players from the middle and lower sections of the league table.

Who is considered a home-grown player? Those who have belonged to the club and participated in the youth program for at least three years between the ages of 15 and 21. In some countries, the scope includes players who have only been registered but have been loaned out to other academies. The squad limit regulations also stipulate that the B-list of under-21 players is unlimited. Consequently, stronger clubs buy players aged 18 or younger in bulk. The effect on the player market is highly questionable, as the regulation means that the market of prospect players is getting also concentrated. Every club has limited opportunities to provide play minutes for development.

If a wealthy academy overfills the U-21 squad by offering attractive contracts, it also means that the number of players will be loaned out. Concisely, the purpose of the club is not to develop the players, they just book the rights. These clubs are mocked as having a 'loan army'. Clubs have used this practice for a relatively long time. However, a recent regulation by FIFA limits the number of players to be loaned out. Maximum eight from 2022, and only six from 2024. As a result, clubs with larger squads were forced to sell players. As can be seen from the above timeline, the restriction on the squad limit was developed gradually and slowly. There is no unified single strategy, and it is difficult to reveal a strategic purpose for the competitive balance in the lack of regulating the amounts spent on players.

2.2. Squad cost limit

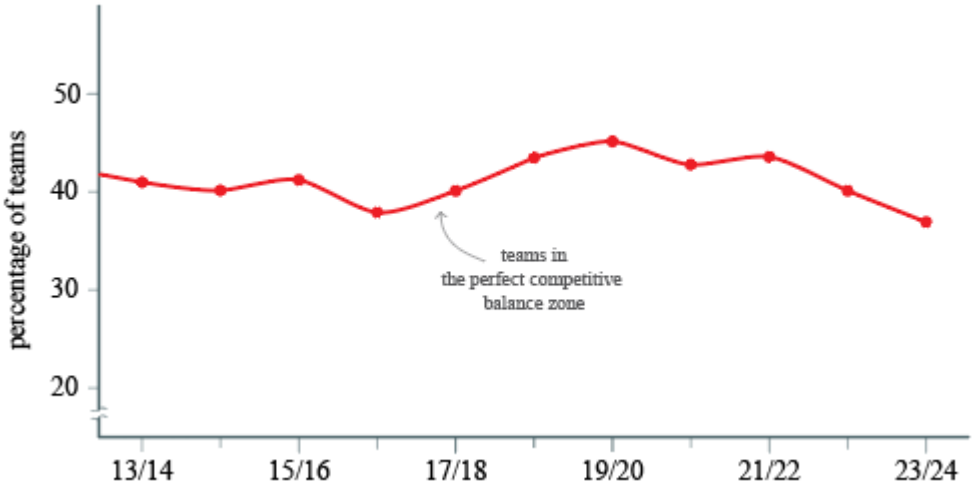
To understand how player payroll limits are applied in European football, a brief review of the development of financial sustainability is needed. The operational balance of clubs in European top football leagues was declining. The net loss of 1.7 billion Euros in 2010 (Table 13 in the Annex). The milestone to turn the negative trend was the introduction of Financial Fair Play (FFP) by UEFA in 2011. As its name suggests, its primary aim was to exempt European football from investment that lacks the rationality of the sports business. Competitive balance is not mentioned among the objectives. However, financial sustainability can be the first step toward the competitive balance. Although two purposes can be harmonized and even linked in a healthy economic environment, the dominant purpose in the European football market was to prevent further serious and unsustainable debts. FFP reversed this negative trend and brought the balance into a positive segment in just six years.

Currently, the European sports market is operating healthier. However, it does not mean that it is balanced or that every club can operate profitably without owner contributions. Since 2022, new regulations have been forced to deliver changes in financial attitudes. The capital contributions can be used for long-term market development. It cannot be used for covering the salaries. The new rules introduced the maximum squad cost ratio. From the 2025/26 season, 70 per cent of the football-related revenues can be spent on players. As a result, the clubs can develop their player squad to the extent of their existing football earnings.

The squad cost limit in Spain approaches the challenge of sustainability in a similar way but takes into account development potential and is less of a brake on investment. The Spanish Football Federation determines a relative salary cap, including payroll and transfer fees, in the next twelve months. The amount is calculated with a complex model and updated every six months. It does not limit the team development if it can be covered by the financial situation. On the other hand, the regulation strictly draws the limit for clubs with unsustainable debts. The lower squad cost limit means that the club is forced to sell players' rights, and at least half of the income must be used for debt reduction. The other half can be spent on salary or transactions. So, the individual high threshold allows the short-term development of Spanish teams but encourages responsible thinking by threatening severe sanctions. Actually, the squad cost limit works as a credit rating.

The squad cost limit highlights a more serious problem in the European football market. The two-fivefold difference in the allowed payrolls of the first five teams in domestic leagues shows the conserving of the differences (Table 14 in the Annex). If bench players in good teams earn more money than the top scorer in another team, the competitive balance will not be improved. As can be seen in the trend in below figure, the competitive balance has not changed since the introduction of financial fair play and squad limit ratio in Spanish football.

Figure 11 – Trend of perfect competitive balance in La Liga



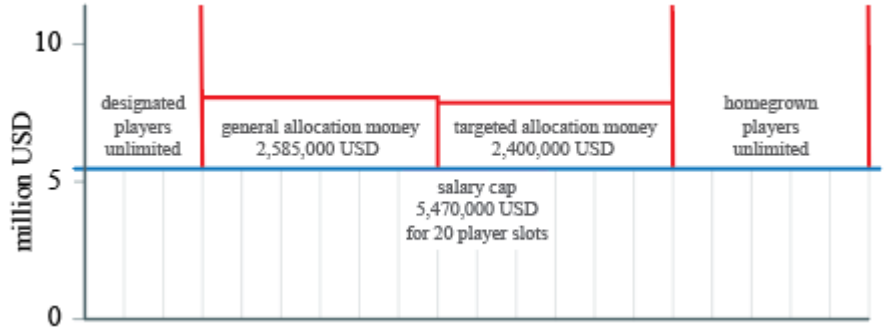
2.3. Salary caps

In contrast to European football, North American regulation aims to ensure competitive balance. Two important differences come from this approach. The squad cost ratio is an individual revenue-proportionate limit in Europe. Each team has a different limit depending on revenues and potency. In the American major leagues, collective revenue-proportionate limits are used. The second difference is linked to first one. In European sports market, there is not minimum requirements. In North America, not only the 'ceiling limits' are defined, but also the 'floor obligations' are prescribed. These two distinctions reflect the purpose of control over the player labour market. The European leagues focus on the financial stability. The American major leagues try to keep teams together, and overall, there is barely a two-fold difference in the payroll of the top and bottom franchises.

The salary cap strategies vary in the American major leagues. The high complexity of the regulations is well reflected in the fact that experts who understand the exceptions of salary caps are called capologists. In this study, the purpose is to detect the impact of the salary cap on competitive balance. Therefore, the principles of American regulation will be described. It is worth categorizing how the American major leagues try to control the player labour market along two dimensions: stringency and flexibility. The well-known soft or hard cap refers to how exceeding the cap is handled. In the soft cap, the overspend is held back by paying compensation to other teams. In the hard cap, disciplinary tools force teams to comply with the cap. In addition, the flexibility means the aspect how permissive the regulations with the exceptions or how adjusted to other sports business aspects. For example, the MLS salary cap is a hard cap, but how the players' salaries should be included in it is quite flexible in order not to hinder the development of European football in North America.

The salary cap is fixed in the MLS, but it is not a single bucket to cover the payroll. The salary control is valid for the 20 spots of the senior squad, called A-list. The supplemental roster is the B-list and is similar to academic players in Europe. Every player on the A-list has a cap charge. It can be regarded as an annual salary benchmark, but the regulation is more flexible. The cap charge depends on the age or homegrown status: aged 24 or older is about 650,000 USD, aged 22-23 is 300,000 USD, aged 20-21 is 200,000 USD, homegrown regardless of the age is 200,000 USD. These amounts are counted against the salary cap. In practice, the salary can vary and be higher than the cap charge or even exceed the overall cap. Three designated players and any homegrown players can have unlimited salaries. They are highly preferred and just partly counted against the salary cap. Consequently, the salary cap does not hinder the bidding war for talented players. Moreover, the franchise has strong tools to retain the local star players.

Figure 12 – Salary cap and additional buckets in MLS in 2024



Further opportunities are offered to legally exceed the salary cap by targeted allocation money (TAM) and general allocation money (GAM). Both serve the same function, providing coverage for player salaries below the threshold of 1.6 million USD. So, while the designated and homegrown stars can have unlimited salaries, the payroll for supported players is limited by salary threshold and allowance. The difference between the two buckets is that GAM can be traded. In this sense, it is an asset, and financial trades with other franchises can increase or reduce. In short, the purpose of the description is to illustrate how the MLS tries to combine the typical restrictions of the American major leagues with the mechanisms of the global football market.

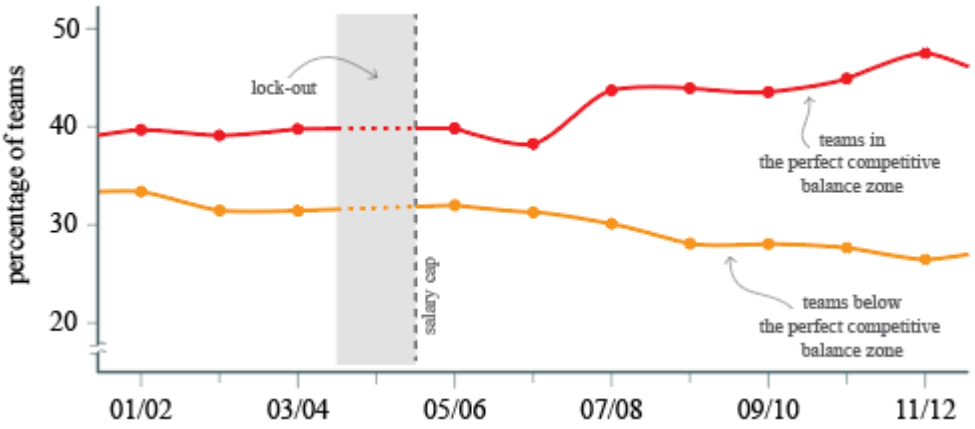
The NHL has introduced much stricter regulations. The debate over the salary cap in North American ice hockey began around the millennium. Due to sports commercialization, player salaries have skyrocketed since 1990. The risk of financial crises loomed, mostly for the franchises on smaller markets. As can be observed in Europe, many examples show that smaller teams are trapped in the limited opportunity for development. Before the Collective Bargaining Agreement (CBA) expired in 2004, the interests clashed in a debate. The players' association (called labour union in European history) tried to protect the earning potential. In other words, each player should earn as much as he

is worth. In order for small teams not to lose the opportunity to have star athletes, an alternative revenue share model was argued for compensation from big-market franchises. The devil is in the details. It is a significant factor in what size of the compensation can be sufficient for keeping the competitiveness.

The approaches of the negotiating parties differed on a few points. The league represented a collective interest. The players' association focused on the interest of high-skilled players. However, the business stability should not or must not rely on only the taxation of large franchises or other revenue-sharing solutions. The cost control is another important pillar of the business model. Since player salaries were the largest item in the league's budget, the new CBA was considered the basis for long-term financial stability. Moreover, the competitive balance was regarded as another pillar of a successful business model, and it requires a collective approach to salaries.

The positions in the negotiation were deeply entrenched, resulted in the franchise owners initiating a season cancellation. It wasn't the players who went on strike. The name of lock-out means the players were not allowed to enter the sports facilities. The dispute was practically decided by the organizational behaviour of the parties. The franchise owners constituted a strong unity and promoted salary uniformity. In contrast, the conceptual unity of the players' union was not achieved because of preferring highly scalable salaries. While the owners formed a solidarity alliance against skyrocketed salaries, the union neglected the risk of salary inequality among the players. The league defended small-market teams. The union did not negotiate in the spirit of brotherhood.

Figure 13 – Salary cap effect on perfect competitive balance in the NHL



Eventually, the NHL introduced a hard salary cap. The revenue-sharing model was adjusted, but the revolutionary changes in North American ice hockey were the limitation on the payroll. The effect can be clearly detected in the change in the competitive balance, figured above. In addition, the diversity of Stanley Cup winners has also increased in recent decades. How well-known is the Vegas Golden Knights? The franchise, founded in 2017, won the Stanley Cup in 2023.

2.4. Salary structure

The NFL has a much longer history of controlling player salaries. Teams applied a per-game payroll in 1920 in order to ensure competitive balance. The rules were gradually developed, but they were not formed in a unified strategy. It was also characteristic of the NFL that teams tried to exploit loopholes with signing bonus, performance bonus and other innovative solutions. Finally, in the nineties, the formal salary cap regulation was created, which practically preceded the revenue explosion due to digital broadcasting. Regarding the fact that the NFL dealt with the competitive balance through player salaries, it probably causes the formal salary cap to have no detectable effect on the competitive balance metric (Figure 26 in the Annex).

The salary control evolution in the NFL incorporated incentive salaries. In contrast, guaranteed salaries are widespread in other top leagues. However, the definition of the salary structure is not black and white. As mentioned earlier, in the transaction view in research, the interests and influences on the development of a phenomenon are much more focused. In the NFL, on the one hand, the league has tried to maintain a sustainable business model; on the other hand, the bargaining position of the players has traditionally been strong. American football is most affected by the scarcity of athletes in the market. Long squads need many players, but the sport is basically done in the United States, and there are generally few people who are big, fast, skilled and willing to risk their physical and mental health. The dynamics of these contradicted interests resulted in the history of loopholes against the salary restrictions and, ultimately, in salaries containing incentive components.

While salaries in baseball, American football and European football are traditionally based on negotiation, the NHL and NBA have a stronger salary structure. Similar to how countries and governments prefer a social solidarity system to set minimum wages or salaries, players' associations have also fought for annual minimum salaries in CBAs. The distinction among the leagues is how fixed or how flexible the negotiation is. One approach is that compensation depends on on-field performance. In the other approach, salary is determined by career years. Both approaches have their own truth. However, the question arises in commercialized sports: Should salary be based on sports performance or business performance? Nowadays, players can build their own fan bases on social media, and clubs also consider these business aspects when signing. If a player has business potential matters, then it should also be reflected in the structured payment systems. Caitlin Clark's emergence brought revolutionary changes to the WNBA. Her popularity in university sports was transferred to the professional league. Without her team being a champion aspirant, or the competitive balance being developed, the viewership and fan attendance in the arenas skyrocketed, leading to more lucrative broadcasting contracts.

The emergence of new aspects can be observed in the changes in salary caps in the last decade. The increasing star cult poses a challenge to regulations aiming at competitive balance. The dilemma of the salary cap is precisely that the objectives of controlled team budgets contradict the business mechanism of the need for outstanding players for more intense marketing activities and community building. The salaries of designated, franchise, flagship, star, iconic or brand players (there are several expressions) can overstretch the salary ranges. As can be seen from the MLS example, a soft or hard cap does not mean how flexible the regulation is. The traditional categorization refers to whether compliance with the rules is achieved through restrictive or incentive elements. The structured or incentive element in flexibility is another dimension. Ultimately, the regulation of the player labor market will be different in each sport, depending on the market situation and the ability to assert interests.

3. Redistribution of resources

The control over the sports labour market approaches the competitive balance and the financial sustainability from the cost side. However, the less equal or blatantly unequal power difference among the teams comes from the revenue side. An outline of specific basic terms and concepts is necessary to understand the strategic decisions of leagues related to resources. Revenues are usually divided into centralized league revenues and local, club or franchise revenues. Inside the local incomes, a distinction is made between sports-related incomes and other incomes. Along the local opportunities, mainly in North America, the terms of big and small market franchises are used. In this study, it is combined with little market teams, which are typical in domestic leagues. The difference in opportunities between a football club in London and the English countryside was illustrated with a simple example in an earlier chapter. It is an axiom of economics and social science that inequality of opportunities determines inequality of outcome. In the sports business, where competitiveness itself is the product, this inequality can damage the saleability. For this reason, stakeholders use the redistribution of resources. The fundamental difference between the North American and European sports models is whether these consolidative measures tact clubs' sports-related revenues or only the league's centralized revenues.

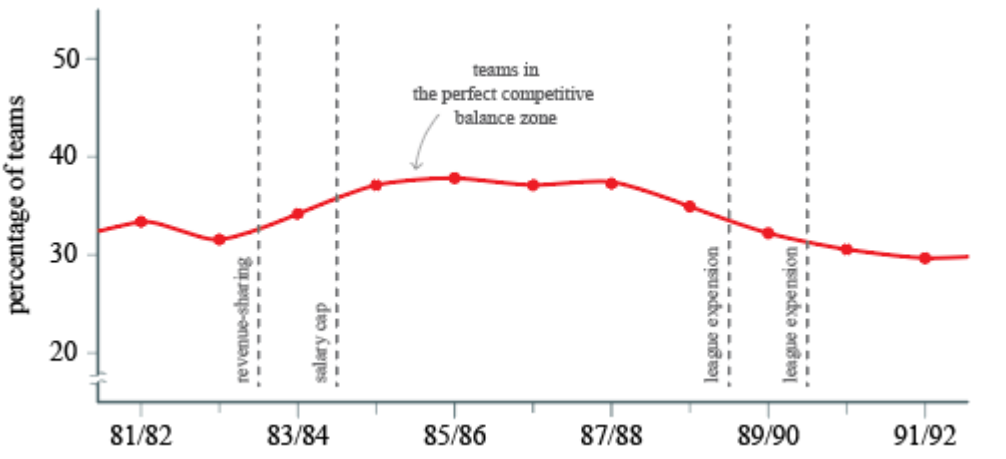
3.1. Revenue-sharing model

In North America, franchises enter the league based on a business decision. It is believed that the possession of proper resources ensures stable sports performance. In Europe, by turning the tables, the sports performance decides about entering the league, assuming that the on-field achievement induces a positive solvency. Of course, the black-or-white explanation merely illustrates

the gravity points of attitudes. According to resource-based thinking, the American major leagues avoid having multiple franchises operate in the same geographical area. For example, if Arizona has a team, the other one cannot be allowed in the same league. The large metropolitan areas are exceptions. However, it is still typical that if a franchise cannot operate properly in an area, it is moved. In summary, American leagues effectively divide the continent, thereby maximizing the availability of resources.

Also, the revenue types are divided between the league and the franchises. The national (meaning for the United States), international and online platform broadcasting fees are channelled to the league. The local, state-level broadcasting deals belong to the franchises. Depending on the population and purchasing power, the TV revenues can be a thicker line in the budget. For example, the franchises in California or East Coast cities are considered large-market teams. Because geographical conditions distort the availability of resources, these franchises pay a significant portion of their sports-related income into the revenue-sharing pool, regardless of the sports performance. The small market teams receive a weighted share. The mechanism in the NBA was introduce with the salary cap regulation. As the figure below shows, in the eighties, the competitive balance was low despite only 22-23 teams belong the league. The combined effect of the revenue-sharing model and the salary cap improved the competitiveness of small market teams. The trend line approached 40 percent, however, it returned to the previous level due to further league expansion.

Figure 14 – Revenue-sharing and salary cap effect on perfect competitive balance in the NBA

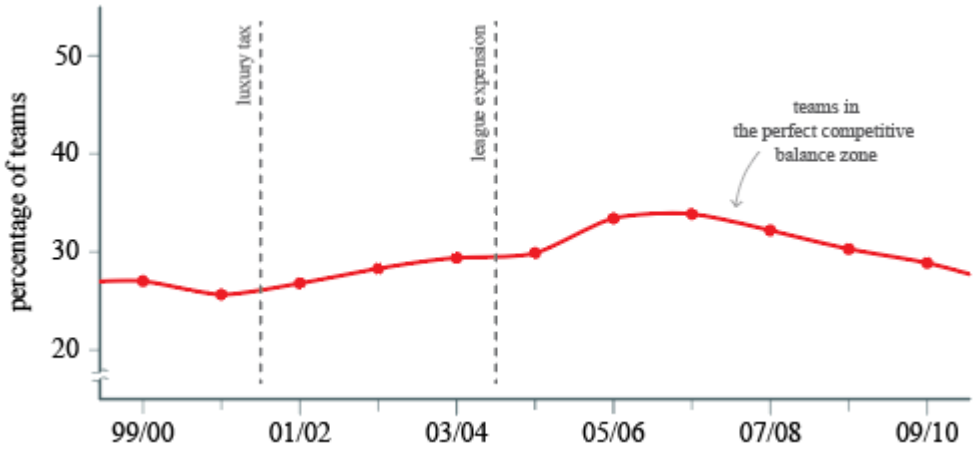


By the end of the 1990s, the NBA had set negative records in competitive balance. The perfect competitive zone accounted for only 25-27 per cent of a team's performance. The league was effectively torn into two parts. In terms of sports business, it is a nightmare. Despite the booming sports market, financial problems arose. The owners were preparing to reduce the players' salaries, eventually leading to a lockout, a shortened 1998-99 season, and new regulations.

3.1. Luxury tax

The luxury tax is related to the teams' payroll. In contrast to the revenue-sharing model, it is paid by teams that exceed the salary cap. The original salary cap regulation in the NBA was the type of hard cap. For a while. More and more exceptions were built in. On the one hand, the handling of exceptions makes sense because many aspects must appear in the strategies. On the other hand, the exceptions practically represent loopholes that ruin the strategy. The basic economic mechanism is that market participants strive for advantages over others. Expressing in an extreme way, the most prominent market actors would most like to monopolize the market. The purpose of interventional measures is precisely to protect the market structure and ensure healthy functioning. The decision-makers dilemma is what mix of restrictive, permissive or compensatory instruments can achieve this. The luxury tax is the latter.

Figure 15 – Luxury tax effect on perfect competitive balance in the NBA



The new salary cap concept in the NBA has been in effect since 2001, introducing the luxury tax. The league does not prohibit teams from exceeding the cap, but they must compensate the league and other teams. The new adjustment increased the competitive balance by roughly five percentage points. This is not a significant change, considering that a higher jump would be expected from a lower level. An example is set to give a clear illustration of the effectiveness of the luxury tax. Nowadays, if a franchise overspends the 170 million salary cap by 50 million USD, the penalty is 191.25 million USD. This amount is collected in the luxury tax pool. The league retains half of that, and the other half is equally shared with the teams below the salary cap. The total tax paid clearly shows the lack of a deterrent (Table 15 in the Annex).

It would be difficult to conclude that the NBA's low competitive balance is a failure of flexible regulation. MLB is the other league in North America that applies a three-level compensation system: redistribution of centralized revenues, large-market franchise revenues and luxury tax. The latter is combined with hard cap restrictions. Similar to European financial fair play, the availability

of the player transfer market can be limited for franchises that exceed the payroll threshold. Probably, strict disciplinary rules are the tool for high competitive balance (Figure 27 in the Annex). A similar result was observed in the European football market, where the strict consequences forced the unrepentant owners to sell players, and the negative financial results turned back into positive in a relatively short time.

MLB's strategy to promote competitive balance and to hold up the distorting overspend is clearly visible (Table 16 in the Annex). However, it is interesting to note that in the last three or four seasons, both in the NBA and MLB, the number of teams paying luxury taxes has increased despite the exponentially skyrocketing tax paid. In conclusion, the existence of a rule alone does not necessarily cause change. The details are important. For example, if the tax threshold or salary cap is not aligned with the financial situation and potential of the franchises, then the implementation will not meet the purpose of the strategy.

3.2. Redistribution of broadcasting revenues

In the double-deck European sports market, broadcasting is not a direct revenue for clubs. In American terms, the international and national (continental in Europe) belong to continental federations, and the local (national in Europe) broadcasting deals are managed by the national federation. Even if the clubs produce media content, this is typically part of marketing expenses, and it means revenue in rare cases. The direct income in Europe is the gate receipts, merchandising, commercial partnerships and positive balance of the player transfers. Broadcasting revenues come through the leagues. As the direct club incomes are intact, there is no revenue-sharing model, luxury or competitive balance tax in the European league, the redistribution of broadcasting revenues provides an opportunity to strengthen the common business interest or solidarity between teams. This is not what happens.

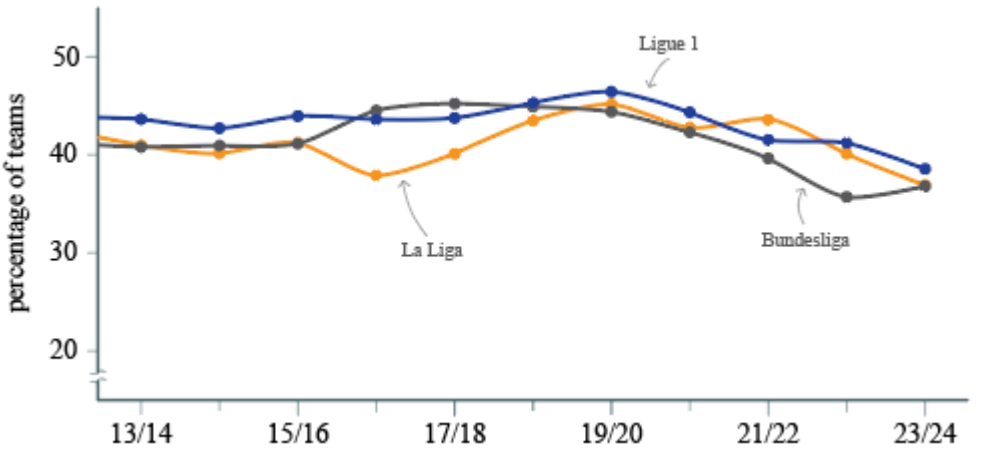
There are three possible redistributions: rewarding, equal, and compensatory. The first one reflects the operating principle of medieval guilds. The leagues are just responsible for collective advantages; the members are eligible for revenues based on their performance. The second redistribution reflects an apparent community truth. It distributes income equally regardless of market performance or conditions. It is typical in the American major leagues. The centralized revenues (excluding revenue-compensation) are equal share to franchises. Lastly, the compensatory distribution, like the revenue-sharing model, is based on the principle that the availability of market resources determines financial and, ultimately, sports performance. These three types should be treated more as thinking methods than as categories. As can be seen, each American regulation is dedicated to a league, and all rules constitute a league strategy. In contrast, the European regulations of redistribution are hybrid. They are driven by more thinking methods.

Table 6 – Redistribution proportions of the broadcasting revenues in the European top leagues [1]

league	rewarding share		equal	compensatory
	performance	viewership	share	share
Premier League	25%	25%	50%	0%
La Liga	25%	25%	50%	0%
Bundesliga	93%	0%	0%	7%
Seria A	30%	20%	50%	5%
Ligue 1	50%	0%	50%	0%

The percentages in the last column are a bit of a euphemism. The clubs get five per cent because of the historical characters, and it probably does not affect small market teams. In the German league, two per cent of broadcasting revenue is distributed based on the playing time of academy players. Just for comparison, in MLS, the homegrown players (regardless of age) are effectively exempt from the salary cap. In the Bundesliga, clubs receive broadcasting revenue share based on sports performance. If Bayern Munich converts economic advantages into sports performance, and the consecutive championship titles are rewarded with a higher revenue share from broadcasting deal, then consequently, the market advantage will be amplified. In other words, performance-based revenue distribution conserves the relationships. This is the source of the name of conservatism as a political ideology. Nowadays, it is called elitism. The stratification barrier is entrenched under the cream of the league without compensatory measures. The competitive imbalance is maintained.

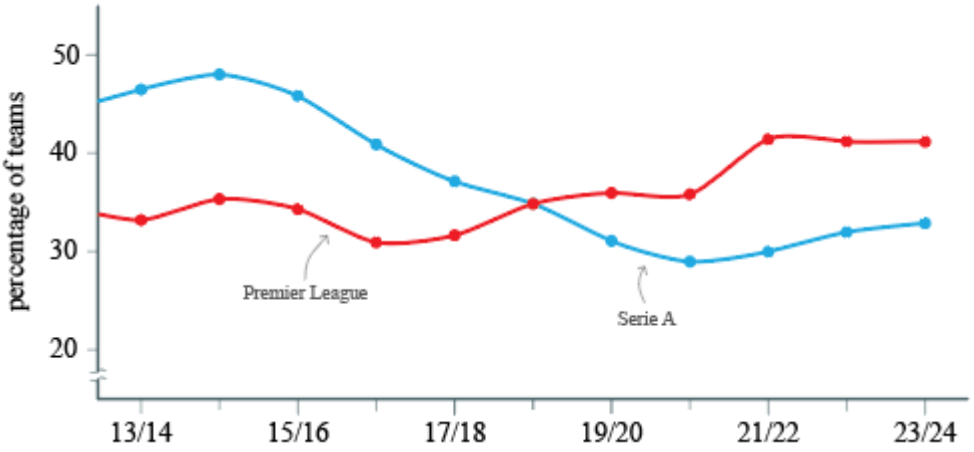
Figure 16 – Trend of perfect competitive balance in the La Liga, Bundesliga and Ligue 1



[1] source: www.tifosy.com/en/insights/broadcasting-breakdown-the-european-big-5-3481

The perfect competitive balance metric in three of the top five European leagues fluctuates around a stable level. In other words, the differences between clubs have been conserved. In the case of two championships, Serie A and Premier League, significant changes can be observed in the last ten years. However, it is not possible to find an explanation through the investigation of strategies. The decline in Italian competition is likely related to national macroeconomic trends.

Figure 17 – Trend of perfect competitive balance in the Premier League and Serie A



Market conditions fundamentally determine the financial opportunities of European clubs. This broad concept includes the purchasing power in the operational area. However, it should also be regarded that the operational area significantly varies. The first-tier clubs are brands on a national or international level. The commercial deals of most teams go beyond local relationships. As a result, clubs can obtain higher incomes but are also more exposed to macroeconomic processes. This process is amplified by digital broadcasting. Some clubs have become continental or even global sports brands. The table below shows the revenue advantage the Premier League clubs have compared to other European top leagues.

Table 7 – Broadcasting revenues in the European top leagues in 2020 (billion euro)[2]

league	domestic	international
Premier League	1.9	1.7
La Liga	1.2	0.9
Bundesliga	1.1	0.2
Seria A	0.9	0.3
Ligue 1	0.7	0.1

[2] source: www.tifosy.com/en/insights/broadcasting-breakdown-the-european-big-5-3481

Another mechanism complements the above fact. As a result of Brexit, the United Kingdom is not subject to the Bosman rule. Brexit was explicitly intended to block the free movement of workers. The English football leagues have introduced restrictions on the transfer market for foreign players. For eligibility to play, a relatively high level of ability must be certified in a pointing system. Although the measure is intended to favour domestic players and homegrown development, combined with the advantages of revenues, it has a significant effect on the European transfer market. To illustrate the phenomenon with a simple example. There are 18 outstanding strikers on the European market so far, roughly evenly distributed among the big teams: six in England (*Big Six*), three in Spain (*Três Grandes*), seven in Italy (*Sette Sorelle*), and two in Germany and France. Due to a more stable financial background, the English mid-of-the-pack clubs can rival the top teams. The economic magnetism has drawn skilled players from Italy. If four players are transferred, the middle teams will become powerful in England, thus improving the competitive balance. The Italian top teams will be compelled to pull the players from their middle teams, thus ultimately declining the competitive balance there. Consequently, even entire leagues can fall into the trap of poor financial and sports performance. For example, many experts debate whether Ligue 1 is considered a top league currently.

CONCLUSIONS

This study can be divided into two main parts: the development of a new research methodology and the impact of strategies and league regulations on the competitive balance measured with the created metric. Instead of the traditional methodology used in previous studies and derived from the characteristics of the continent-specific sports markets, a global methodology is created in this study. Striving to avoid comparing apples with oranges, a unified base material is preferred. The shared percentage expresses the sports performance of the teams in the same way, independently from how the league points are calculated in North America, Europe or anywhere in the world. The competitive balance metric aggregated from this base material achieves the second important expectation for the metrics, which is interpretability. The backbone of the approach is to derive the concept and arithmetical definition of the perfect competitive balance from the game uncertainty according to the principles of probability calculation. This solution provides a reference value representing the desired competitive balance. The central value of the new metric shows that the percentage of the teams' performance in a competition falls into the perfect competitive balance zone. The side values can express the distribution skewness.

For evaluating strategies, the American sports market attitude is considered as a starting point. The sports performance depends on the market conditions. This statement does not deny that outstanding sports performance can cause positive financial results. Merely, the market conditions are placed in the focus and at the beginning of the logical sequence. Based on this idea, it is valid to assume that these conditions can be transformed. Strategies that formulate competitive balance as a goal are considered regulatory interventions. Besides the direct league decisions, other strategies can also have an effect on the market position of franchises or clubs.

It can be clearly identified that increasing the number of teams in a competition means a high risk of damaging competitive balance while the league reduction can improve it. However, this is not an axiom that could not be compensated for with other strategies. It is observed that salary caps and luxury tax measures can moderate labour market distortions. However, stringency and flexibility are decisive factors. Moreover, probably an important point is whether oversupply or overdemand is experienced in the transfer market. Lastly, the third type of strategy is revenue distribution or redistribution. Significant continental differences can be identified in this category. European regulation preserves market conditions. The pursuit of competitive balance is not identified. American revenue-sharing models, on the other hand, can reduce the differences between big and small market franchises, even if the regulations differ in efficiency. Interestingly, the popular belief that market behaviour is more liberal in North America, while the regulated market mechanism is more typical in Europe, is reversed in the case of competitive balance.

A sharp continental contrast can also be observed based on the attitudes and motivations dominating North American and European sports markets. However, there is an interesting business situation and managerial decision in the case of leagues that try to adapt the continent-specific aspects to the other side of the ocean. Strategies should align with the socio-cultural and economic environment. They do not have a global truth. Consequently, it cannot be stated that only a good solution is detected in the well-developed American sports market, nor that the European market would be deprived of solutions that effectively improve the competitive balance.

The characteristic of strategies is that they should align with the situation and reflect the intention of the decision-making. Every market has a different structure. Every market has a different cultural background. Every market has a different legal environment. Every market has been driven by different decision-making attitudes. Lastly, every market has been influenced by different skills of realising and implementing interest. Concisely, the stakeholders shape the market, and strategies will be reflected in the combination of the above conditions. However, the success of strategies is never guaranteed. The regulation can fall into the trap of interference from internal elements or external factors. The road to hell is paved with good intentions.

Although the purpose of this study is to identify the impact of strategies on the trend of competitive balance, several questions arise and make further research necessary. In particular, an analysis of the market conditions specific to the given sport, including the player labour market, to understand the market mechanism and dynamics, thus its effect on the nature of competitive balance. Since the objective of strategies is or should be to change distorted market conditions, it would be important to identify the factors that determine and limit the development of the sports market.

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ANNEXES

Annex 1. Glossary of terms

Big Six: traditional collective name for the best English football big-market teams such as Arsenal, Chelsea, Tottenham Hotspur, Liverpool, Manchester City and Manchester United.

cluster: collection in a population expressed data point clouds and reflecting similar characteristic based on more variables

commercialized sport: after the amateur and professional levels, it is the environment of sports in which sports organizations operate primarily as business actors, with an investor and profit-oriented approach.

concentration of capital: process of financial resources or assets becoming possessed decreasingly number of market actors

data point: representing a value belonged to a member of population along a variable or dimension

dataset: separated collection of data including more variables or dimensions

dispersion: statistical measurement of how the data points is arranged in a dataset

distribution: statistical measurement of how the data points is frequented in a dataset

fluctuation: variation in position of a member in a population reflecting a qualitative change

gameday revenue: total revenue related to game organized by sports organization including ticket sales and any financial benefits of sports organization derived from sales products and services in the sport facility

gate receipts or **gate revenue**: total revenue of ticket sales of game organized by sports organization.

major league city: collective name for North American cities having teams in professional leagues, traditionally including baseball, American football, basketball, and ice hockey, and in some cases also soccer as European football

major leagues: collective name for North American professional sports leagues, including in this study Major League Baseball, Major League Soccer, National Football League, National Hockey League, National Basketball Association and Women National Basketball Association

major sports: collective name for American-born professional sports, including American football, baseball, basketball and ice hockey

mean: arithmetical middle value of an ascending-ordered dataset which is less sensitive to extreme values distorting the average.

median: middle value of an ascending-ordered dataset which is less sensitive to extreme values distorting the average

normalized value: variable or dimension scaled from 0 to 1

range: the mathematical distance between the data point of lowest and data point of highest value in a dataset.

revenue sharing: collective name for strategies redistributing the individual revenues to compensate the disadvantages of the small market franchises

salary cap: collective name for strategies maximizing the individual player salary or collective franchise payroll

scale: the mathematical distance between the optional lowest and highest value in a dataset along a variable or dimension

Sette Sorelle (Seven Sisters): traditional collective name for the best Italian football big-market teams such as AC Milan, AS Roma, Fiorentina, Internazionale, Juventus, Lazio and Napoli. Nowadays, the members of the group are debatable.

spread: arrangement of the values in an ascending-ordered dataset

squad cost limit: regulations maximizing the club payroll

squad limit: regulations maximizing the number of players in a team

standardized value: variable or dimension scaled from −1 to +1 with the mean being on 0

static view: traditional scientific approach using typologies and descriptive explanations

stratification or **strata**: separated subgroups in a population based on qualitative characteristic in an ascending-ordered dataset

transformational view: economic scientific approach focusing on the changes induced by influence and managerial decisions

Três Grandes (Big Three): traditional collective name for the best Spanish football big-market teams such as Atletico Madrid, FC Barcelona and Real Madrid.

uncertainty of outcome: expressing the unpredictability of an event, in this study is related to parts of sports competition like game, championship title race or season

Annex 2. Tables

Table 8 – Categorization of sports and leagues in the study

Sports	European competition	American major league
American major sports		
Baseball		MLB
American Football		NFL
Ice Hockey		NHL
Basketball	EuroLeague (EL)	NBA, WNBA
European sports		
Football	UEFA Champions League (UCL)	MLS
	Premier League (PL – England & Wales)	
	La Liga (LL – Spain)	
	Bundesliga (Bl – Germany)	
	Serie A (SA – Italy)	
	Ligue 1 (L1 – France)	
	Süper Lig (SL – Turkey)	
	Ekstraklasa (Ek – Poland)	

Table 9 – Draws in NFL and football leagues in the last five season

league	amount of draws	p (%)
NFL	5	0.37
Premier League	432	22.74
Süper Lig	464	25.38
Ligue 1	440	25.51
Serie A	491	25.84
Major League Soccer	577	26.07
Ekstraklasa	382	27.32
Bundesliga	419	27.39
La Liga	521	27.42

Table 10 – Default pointing system[3]

sport	league	type	RW	OTW	D	OTL	RL
American football	NHL	Pct	1		0.5		0
Baseball	MLB	Pct	1	1		0	0
Basketball	NBA & EL	Pct	1	1		0	0
	FIBA	Pts	2	2		1	1
Ice Hockey	NHL	Pts	2	2		1	0
	IIHF	Pts	3	2		1	0
Football	FIFA & MLS	Pts	3		1		0

Table 11 – Frequency of match goal difference in Premier League in the last five seasons

GD	home win	draw	away win
0		432	
1	382		307
2	242		186
3	127		88
4	51		29
5	26		14
6	4		3
7	3		1
8	1		1
9	2		1
All	838	432	630

[3] RW: regulation time win, OTW: overtime win, D: draw/tie, OTL: overtime loss, RL: regulation time loss; pct: percentage, pts: points

Table 12 – Frequency of match goal difference in Premier League in the last five seasons

SPct	probability	Premier League	overlap
0	1.32349E-23	0	0
0.0131579	1.00585E-21	0	0
…	…	…	…
0.381579	0.0109129	0.06	0.0109129
0.394737	0.0170968	0.01	0.01
…	…	…	…
0.473684	0.0822177	0.05	0.05
…	…	…	…
0.618421	0.0109129	0.01	0.01
0.631579	0.0065932	0.04	0.0065932
…	…	…	…
0.986842	1.00585E-21	0	0
1	1.32349E-23	0	0
Sum	1.0000	1.0000	PCB: 0.4123

Table 13 – Aggregate net results in European top football leagues (billion euro)[4]

season	result
2009/10	−1.6
2010/11	−1.7
2011/12	−1.1
2012/13	−0.8
2013/14	−0.8
2014/15	−0.5
2015/16	−0.3
2016/17	+0.6

[4] source: www.footballbenchmark.com/library/overview_of_the_new_uefa_financial_fair_play_regulations

Table 14 – Squad cost limits in Spain in 2024 summer (million euro)[5]

club	limit
Real Madrid	754.9
FC Barcelona	426.4
Atletico Madrid	310.7
Real Sociedad	159.3
Villareal	135.9
…	…
Getafe	39.2
Alaves	38.6
Leganes	37.1
Espanyol	8.8
Sevilla	2.5

Table 15 – League-wide total luxury tax paid in the NBA (million USD)[6]

season	tax payer teams	paid tax
2016/17	2	27.8
2017/18	4	118.2
2018/19	5	157.0
2019/20	4	12.7
2020/21	7	264.1
2021/22	7	479.2
2022/23	9	521.8
2023/24	8	633.6
2024/25	14	609.3

[5] source: www.laliga.com/en-GB/transparency/economic-management/squad-cost-limit
[6] source: www.spotrac.com/nba/tax/

Table 16 – League-wide total luxury tax paid in the MLB (million USD)[7]

season	tax payer teams	paid tax
2016	6	74.0
2017	5	65.0
2018	2	14.3
2019	3	27.7
2020	0	0.0
2021	2	33.9
2022	6	78.4
2023	8	209.7
2024	8	269.3

[7] source: www.spotrac.com/mlb/tax/

Annex 3. Figures

Figure 18 – Dominance in the top European football leagues

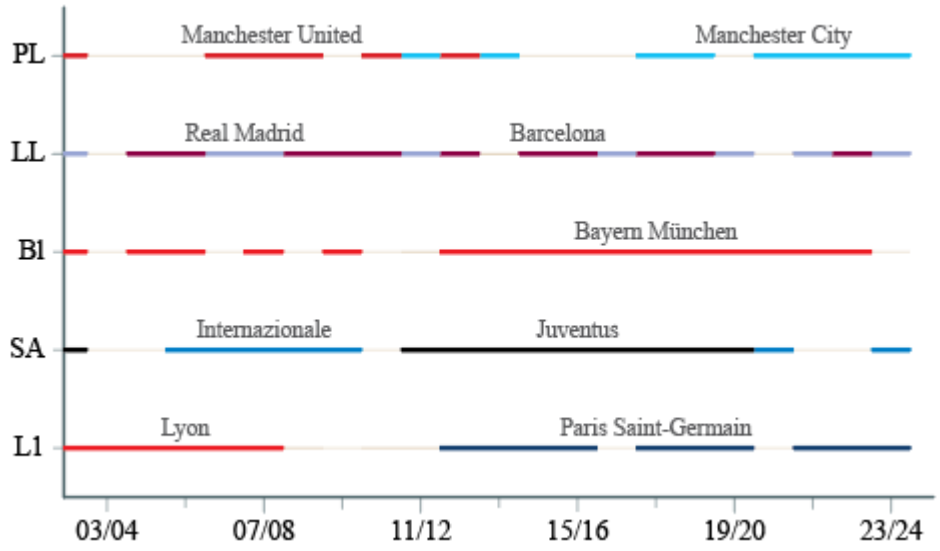

Figure 19 – Frequency of seasons by point advantage of the champions in the top European football leagues in the last ten seasons

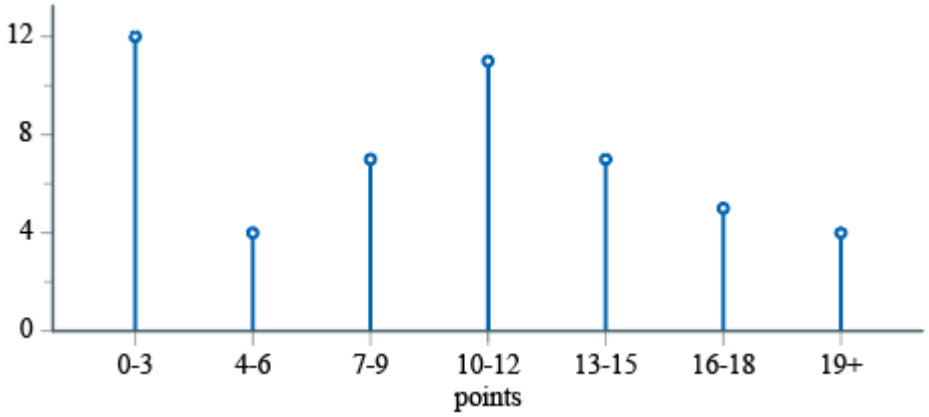

Figure 20 – Ranges of team performance based on shared percentage in Premier League in the last eleven season

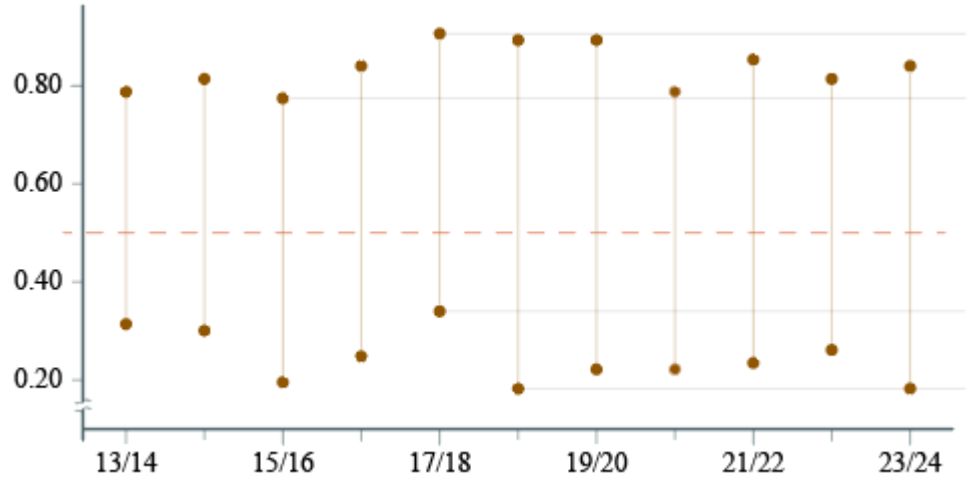

Figure 21 – Distribution bins of teams based on league points in Premier League and in Bundesliga in the last five seasons

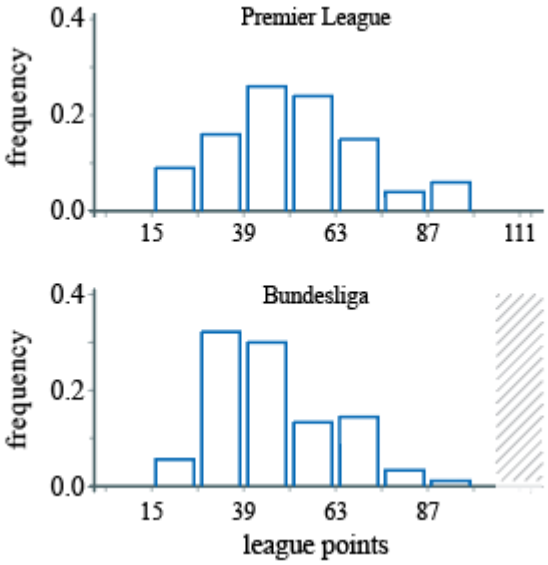

Figure 22 – Distribution bins of perfect competitive balance in American major leagues, football and EuroLeague basketball

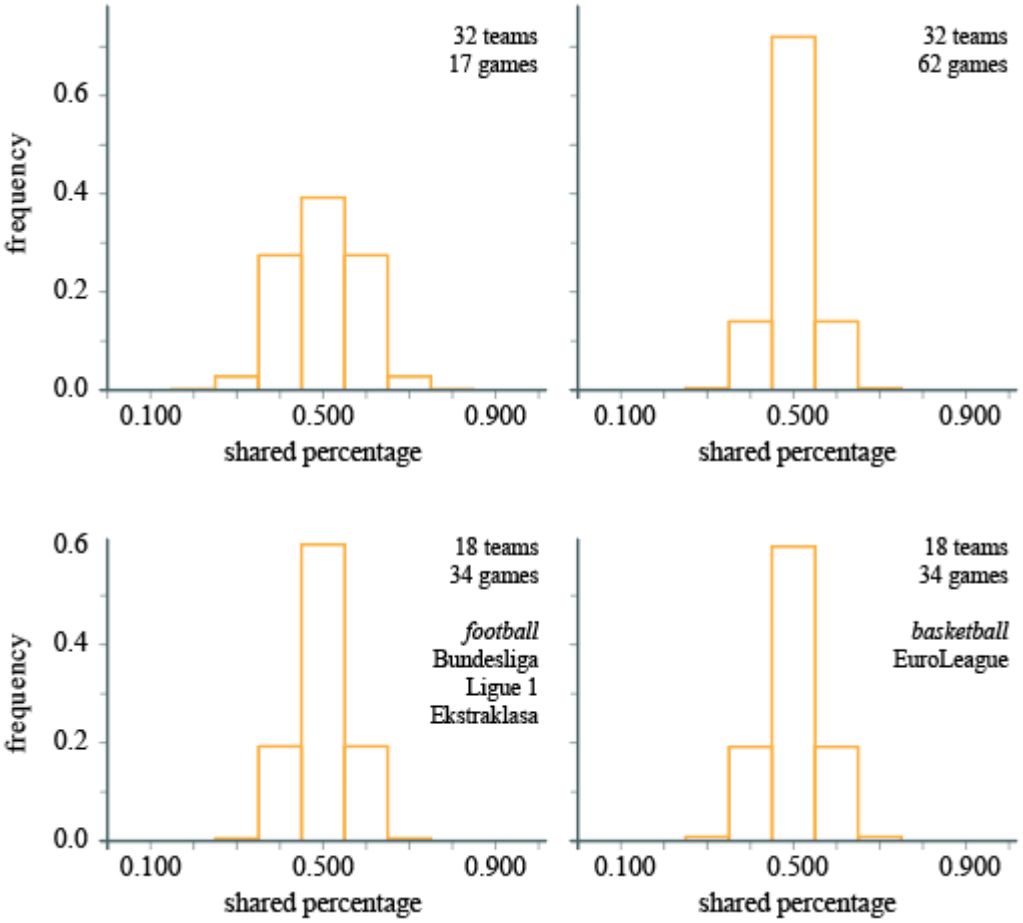

Figure 23 – League reduction effect on competitive balance in Hungary

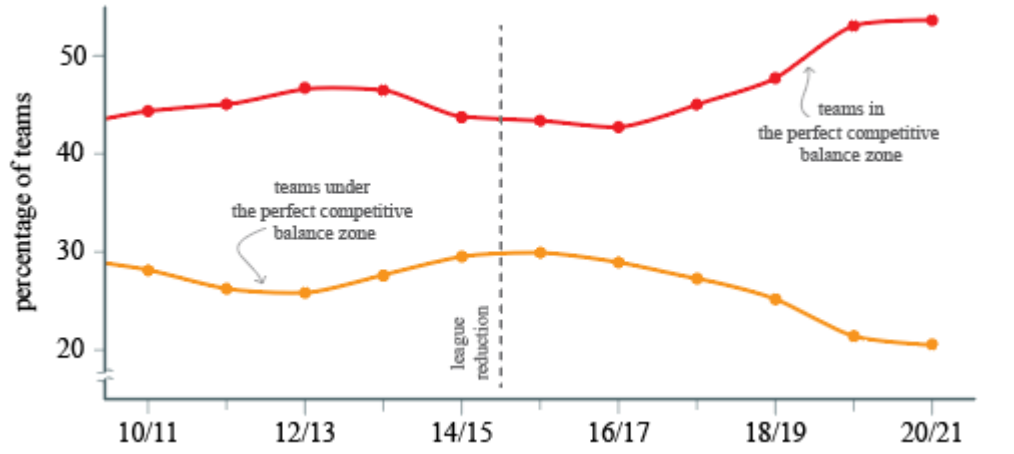

Figure 24 – League expansion effect on competitive balance in Süper Lig

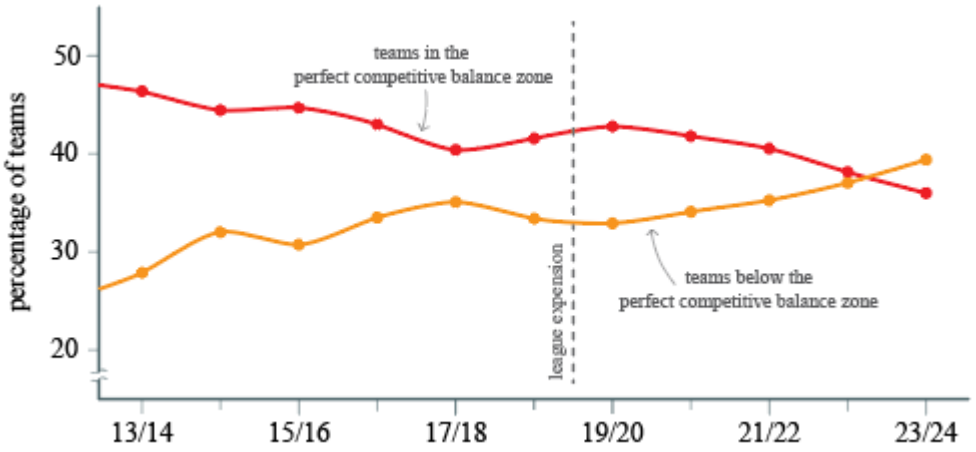

Figure 25 – League expansion effect on competitive balance in Ekstraklasa

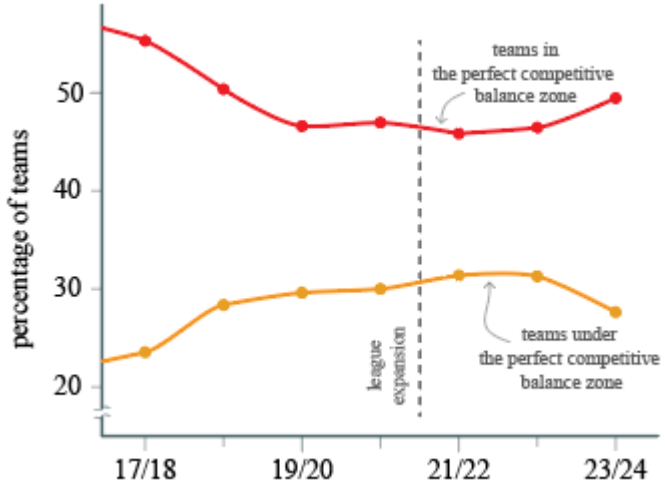

Figure 26 – Salary cap effect on perfect competitive balance in the NFL

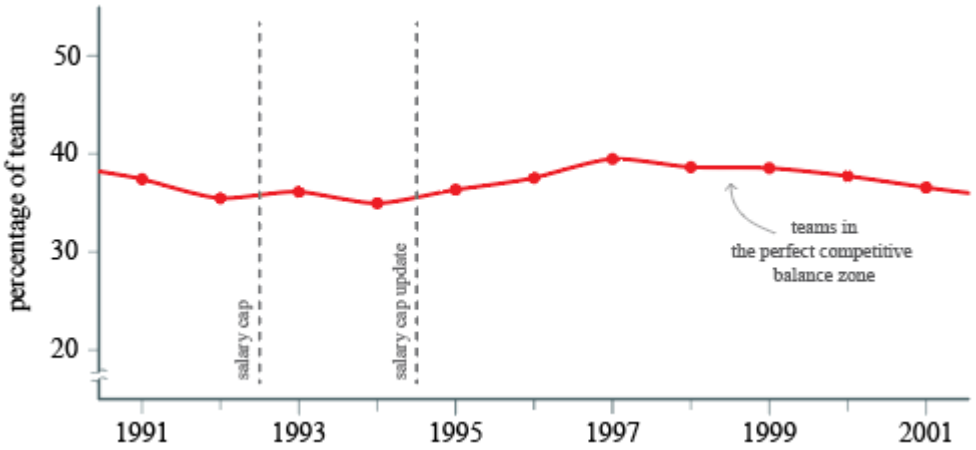

Figure 27 – Luxury tax effect on perfect competitive balance in the MLB

