Top Clubs' Performance and the Competitive Situation in European Domestic Football Competitions

Tim Pawlowski, Christoph Breuer, Arnd Hovemann

1. Dr Tim Pawlowski (correspondence)

Graduate in Political and Sports Economics
Research Assistant
Institute of Sport Economics and Sport Management
German Sport University Cologne
Institutsgebäude II, EG, Raum 5
Am Sportpark Müngersdorf 6
50933 Cologne
Germany
phone: +49-221-4982-6098
fax: +49-221-4982-8144
e-mail: pawlowski@dshs-koeln.de

2. Prof. Dr Christoph Breuer

Full Professor at German Sport University Cologne
Institute of Sport Economics and Sport Management
German Sport University Cologne
Research Professor at German Institute for Economic Research (DIW Berlin)
Institutsgebäude II, EG, Raum 5
Am Sportpark Müngersdorf 6
50933 Cologne
Germany
phone: +49-221-4982-6095
fax: +49-221-4982-8144
e-mail: breuer@dshs-koeln.de

3. Arnd Hovemann

Graduate in Sport Economics, European Master in Sport Management
Ernst & Young AG
Wittekindstrasse 1a
45131 Essen, Germany
phone: +49-201-2421-21956
fax: +49-181-3943-21956
e-mail: Arnd.Hovemann@de.ey.com

Top Clubs' Performance and the Competitive Situation in Domestic Soccer Competitions

Abstract (100 words)

The increase in payouts to European football clubs appearing in the UEFA Champions League (CL) in 1999/00 had a lasting impact on the performance of top clubs in domestic football leagues. This policy change is treated as a natural experiment to compare the level of competitive balance in five top European leagues (England, Spain, Italy, Germany, and France) before and after the turn of the millennium. Based on several competitive balance measures, this paper reveals a significant decrease in competitive balance after the modification of the CL payout system.

Keywords (4–5)

competitive balance, football, media income, UEFA Champions League

Authors' Note

We are grateful to the guest editor, Brad Humphreys and two anonymous referees whose comments and suggestions significantly improved the paper.

1. Introduction

Since the introduction of the Champions League (CL) (previously called the European Champions Clubs' Cup), an annual pan-European football competition that takes place at the same time as domestic league competitions, many modifications have been made to the format of the CL. One of the most striking was put into practice in the 1999/2000 season: an increase in number of participating teams from 24 to 32 and a large increase in payments to the participating clubs. Alongside numerous other factors (e.g. an increase in national media revenues, investor market entries, successful internationalization efforts of European clubs), this boost in the payment to clubs participating in the CL might have a lasting impact on the performance of clubs participating in the CL in domestic leagues since these clubs are able to invest more money in talent (salaries, transfer fees) compared with other clubs in the league. Figure 1 illustrates the increase in payments to CL participants.

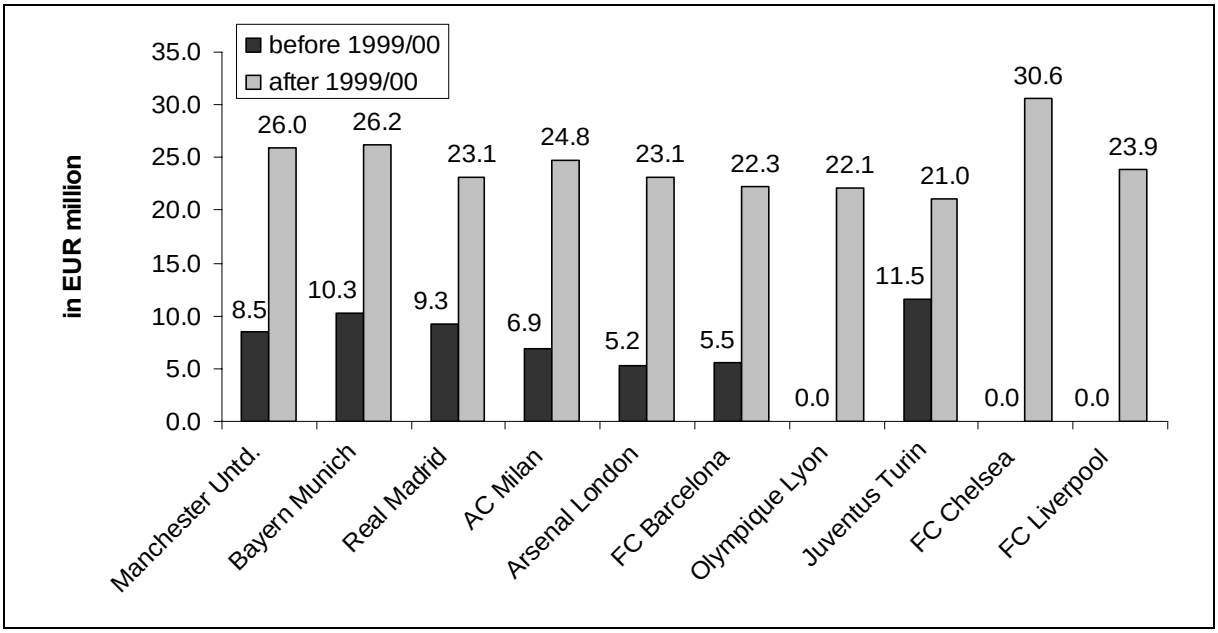

Figure 1: Average payments per year of participation in the CL to selected participants before/after 1999/00 (source: UEFA).

We can also observe a significant spread in the market value of first division teams within domestic leagues following this change in CL payments. According to Frick (2007), the market value of the smallest first division teams in millions of Euros in 2006/2007 was well below 50 million Euros -- Watford FC (England): 37, Gimnastic de Taragona (Spain): 19, Scoli Calcio (Italy): 14, Ernergie Cottbus (Germany): 17, AFC Valenciennes (France): 12) -- while the most valuable teams in each domestic league had market values in excess of 300 million Euros -- FC Chelsea: 405, FC Barcelona: 356, Juventus Turin: 320, Bayern Munich: 182, Olympique Lyon: 166. Given the interdependency between economic and sporting outcomes (Dietl & Franck, 2005), a comparison of clubs' performance before and after the increase in CL payments can be thought of as a natural experiment to understand the effect of CL participation on the level of competition in the top five European football leagues (England, Spain, Italy, France, and Germany), before and after this policy change. This paper makes two contributions to the literature:

(1) Identify and discuss changes in competitive balance in domestic football competitions in Europe that can be attributed to the increased value of CL participation;

(2) Explore the economic and financial implications of the dual system of football club competitions currently in place in top-level European football.

The paper is organized as follows: section 2 discusses the dimensions of competitive balance (CB), the factors influencing CB in football leagues and reviews the relevant research on CB in football; section 3 discusses the measures of CB in sports leagues used in this analysis; section 4 presents the results of our analysis of CB in the top five European leagues; section 5 discusses the implications of the results and

possible policy responses, and makes an overall assessment of the consequences of the two level competition in European football.

2. Previous Research on Competitive Balance

Sports economists decompose competitive balance into a *within-season* component (e.g. Cairns, Jennett, & Sloane, 1986) and the *within-team* component (e.g. Buzzacchi, Szymanski, & Valletti, 2001). The former refers to performance differences across teams in a league within a season (e.g. uncertainty of the outcome for championships, relegation, and qualifications for the pan-European competitions); the latter refers to the performance of a given team over a period of time (e.g. long-term dominance). A certain degree of CB is often seen as a key component to success of sports leagues and therefore "each competitor has an inherent interest in maintaining the health of their rivals" (Groot, 2008, p. 25). A central argument in this context is that excessively imbalanced competition might have a negative impact on fan interest and, hence, on demand (Késenne, 2006; Zimbalist, 2003). Furthermore, unbalanced sports competitions are linked to certain risks, like the risk of the splitting-off and reorganization of top clubs into a separate league or the risk of bankruptcy of lagging clubs (Michie & Oughton, 2004). In addition, CB depends on the distribution of player talent among clubs (Késenne, 2000). Although Drewes (2003, p. 245) mentioned "that it is not revenue potential that makes a club a strong club, but what club management makes out of this potential," clearly access to different revenue streams (e.g. qualification for pan-European competitions like the CL [1]) might have a lasting impact on domestic league competition given the observed interdependency between economic and sporting outcomes (Dietl & Franck, 2005). Sanderson (2002) identified several factors that indirectly influence CB in sports leagues: differences in the access to

publicly financed infrastructure; differences in access to technology; a lack of integrity in club or league outcomes (e.g. the betting scandal in Italy); doping; and physiological differences between players, which can be closely related to player talent. Furthermore, non-sports-related factors like distribution of media rights fees (i.e. centralized marketing with revenue sharing yields a smaller income gap between the top and the bottom clubs than decentralized marketing), differences in national tax systems (i.e. lower taxation on players' income might yield a competitive advantage for a domestic league in that country), regulation of property rights like the 50+1 rule that makes investor market entries less likely in Germany, and salary caps might influence inter- and intra-divisional revenue distribution and hence CB within and between leagues. In addition, sports-related regulations like the promotion and relegation system, the point score ranking system, and the number of opponents in a league might also have an impact on CB.

Previous studies on CB in football reveal important differences in CB across leagues. Some of the findings appear contradictory, which can be attributed to differences in the time periods analyzed. While some studies detect no significant changes in CB (Feddersen, 2005; 2006: German first division; Feddersen & Maennig, 2005: German first division; Goossens, 2006: German, French, and Spanish first divisions; Groot, 2008: French and Spanish first divisions; Koning, 2000: Dutch first division; Michie & Oughton, 2004: French first division; Szymanski, 2001: English first division), others contain evidence of a decline in CB in some leagues (Goossens, 2006: English and Italian first divisions; Groot, 2008: English, German, Italian, and Dutch first divisions; Michie & Oughton, 2004: English, German, Italian, and Spanish first divisions). Some studies exist that analyzed the impact of specific factors on CB in football

leagues, including the promotion and relegation system (Buzzacchi, Szymanski, & Valletti, 2001; 2003; Noll, 2002), the point score system (e.g. Haugen, 2008), salary distributions (Hall, Szymanski, & Zimbalist, 2002), the number of competitors (Cairns, 1987; Groot, 2008), and revenue distribution within a league (e.g. Andreff & Bourg, 2006). All of these factors were found to influence CB in football leagues in predictable ways.

Summing up, the competitive situation in European football leagues has already been analyzed in previous studies. In particular, recent research found empirical proof for a decline in CB in some leagues as a result of different impact factors. However, no study exist that analyzed changes in CB in domestic football competitions that can be attributed to the increased value of pan-European competitions.

3. Measures of Competitive Balance

Common indicators of competitive outcomes in sport leagues include league position, winning percentage, and points won by clubs. In general, winning percentage is the most widely used indicator in studies of CB in North American sports leagues. In sports like football, where drawn games are possible and common, winning percentage might be a biased indicator [2]. While Szymanski (2001) argued that winning percentage is still a reliable indicator of success in English football, the CB measures used here depend on the points scored in a season and the team's league position at the end of a season. For inter-seasonal comparability, and to capture the transition from a 2–1–0 to a 3–1–0 point award system, the results from the 2-point system in place in France until 1993/94 and in Germany, Spain, and Italy until 1994/95 are converted to a 3-point system based on actual match results.

We use the following measures of competitive balance to analyze the effect of the increase in payments for CL appearances after 1999/2000. The *Hirshman Herfindahl Index* (HI) is used, based on the sum of the quadratic share of points (s_i^2) won by each club in a league with N teams. For inter-divisional comparability and to account for changes in the size of leagues over time, this measure is modified to the so-called *H-Index of Competitive Balance* (HICB), which is the ratio of the HI to the HI of a perfectly balanced league (Depken, 1999):

$$\mathrm{HICB} = \frac{\sum_{i=1}^{N} s_i^2}{1/N} * 100. \quad \textbf{(1)}$$

The *concentration ratio* (CR_i) is used, based on the share of points (s_i) won by the n=1,2,…i clubs compared with the entire league. The CR measure is calculated for the top five clubs (CR_5) on the table for each league since these clubs regularly play in pan-European competitions. Since this measure is sensitive to league changes as well, the CR_5 is modified to the so-called *C5-Index of Competitive Balance* (C5ICB), which is the ratio of the observable CR to the CR of a perfectly balanced league:

$$\mathrm{C5ICB} = \frac{\sum_{i=1}^{5} s_i}{5/N} * 100. \quad \textbf{(2)}$$

The most commonly used measure in studies of CB in North American leagues is the *standard deviation* (SD) of team winning percentage within a season. Based on the individual points ($TP_{t,i}$) of a team i and the average number of points within a league of N opponents $\overline{TP_t}$, one can describe the *standard deviation of league points* ($SDLP_{N,t}$) for a certain season t as:

$$SDLP_{N,t} = \sqrt{\frac{\sum_{i=1}^{N}(TP_{t,i} - \overline{TP_t})^2}{N}}. \quad \textbf{(3)}$$

All three of these measures capture within-season CB. For each of these measures, a decline in CB is reflected by an *increase* in the index.

One CB measure that captures team-specific variation across seasons is the *standard deviation of team points* (SDTP). Following Humphreys' (2002) measure (which is based on winning percentage), the $SDTP_{T,i}$ is the individual standard deviation of total points won per season ($TP_{t,i}$) by team i across a certain number of T seasons:

$$SDTP_{T,i} = \sqrt{\frac{\sum_{t=1}^{T}(TP_{t,i} - \overline{TP_i})^2}{T}}. \quad \textbf{(4)}$$

Here, a decline in CB is reflected by a *decrease* in the index. The *competitive balance ratio* (CBR), which is a comprehensive measure that captures both CB components, can be easily derived as the ratio of the average *standard deviation of team points* to the average *standard deviation of league points* (Humphreys, 2002):

$$CBR = \frac{\overline{SDTP_T}}{\overline{SDLP_N}}. \quad \textbf{(5)}$$

The smaller the value of the CBR, the less balanced is the league. Compared with other approaches (e.g. Groot, 2008), the CBR is made up of both components and therefore provides a comprehensive and comparable measure of CB.

Finally, we make use of the Markov process technique (Bherends, 2000) that was first used to evaluate competitive balance in MLB by Hadley, Ciecka and Krautmann

(2005). They analyzed the probability that a given team's performance (whether it qualifies for postseason play or not) in one season depends on its performance in the previous season (Leeds & von Allmen, 2005). Like Hadley, Ciecka and Krautmann (2005) we identify two different states in terms of a team's finish to check for the variation of top clubs' performances:

1. A team qualified for the CL group stage (in)
2. A team did not qualify for the CL group stage (out) [3].

Four transitional probabilities are calculated based on the final place of each team in the league standings in two consecutive seasons: (1) a team repeats in qualifying for the CL (P_{ii}), (2) a team goes from not being in the CL in one season to being in the CL in the next season (P_{oi}), (3) a team goes from being in the CL in one season to not being in the CL in the next season (P_{io}), (4) a team repeats in not qualifying for the CL (P_{oo}).

4. Results

Figure 2 shows the average *H-Index of Competitive Balance* in the top European leagues before and after the change in payout to CL participation that took place at the turn of the millennium. Like Eckhard (1998) we compare two time periods of equal lengths (1992/93–1999/00 and 2000/01–2007/08). Based on the H-index values CB declined in three (Germany, Italy, England) out of the five leagues after the turn of the millennium. The English Premier League and the Italian Serie A especially were more unbalanced in the later period.

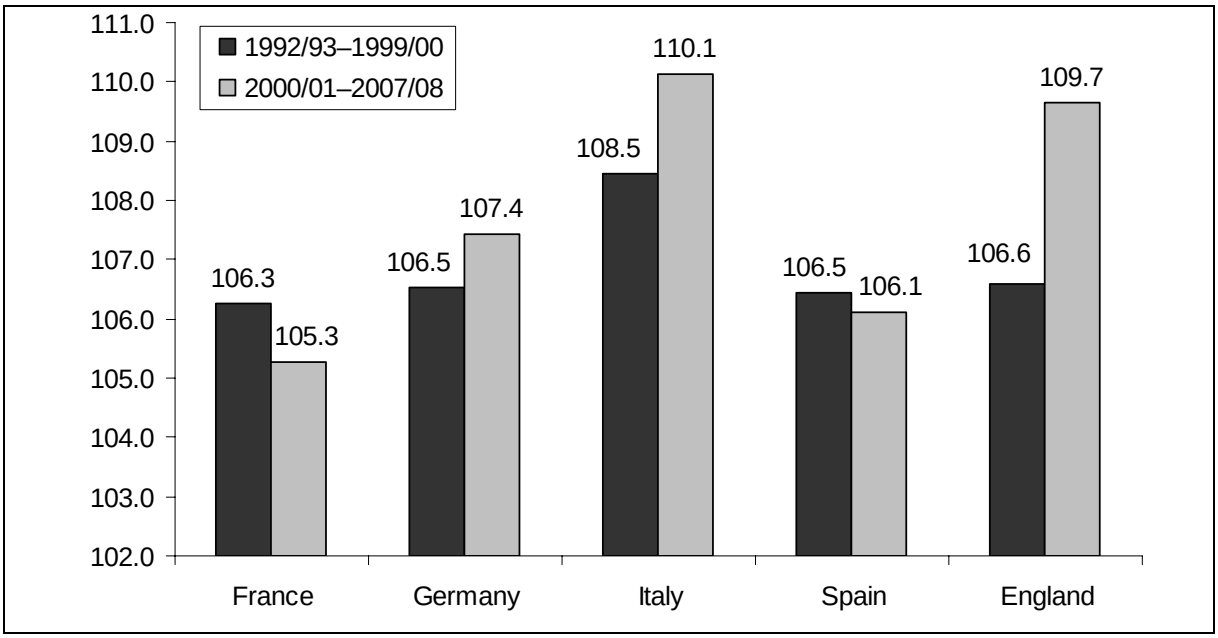

Figure 2: The average *H-Index of Competitive Balance* in the European top leagues before and after the turn of the millennium.

Observed changes in the average *C5-Index of Competitive Balance* in these leagues reinforces the results above. With the exemption of the French Ligue 1 all the leagues experienced a decline in CB based on the C5-Index (see figure 3). The parallel changes in the two CB measures suggests that the performance of the top five clubs had a considerable impact on the competitive situation in the leagues, and that the increase in payments to CL participants had an adverse impact on CB in these leagues.

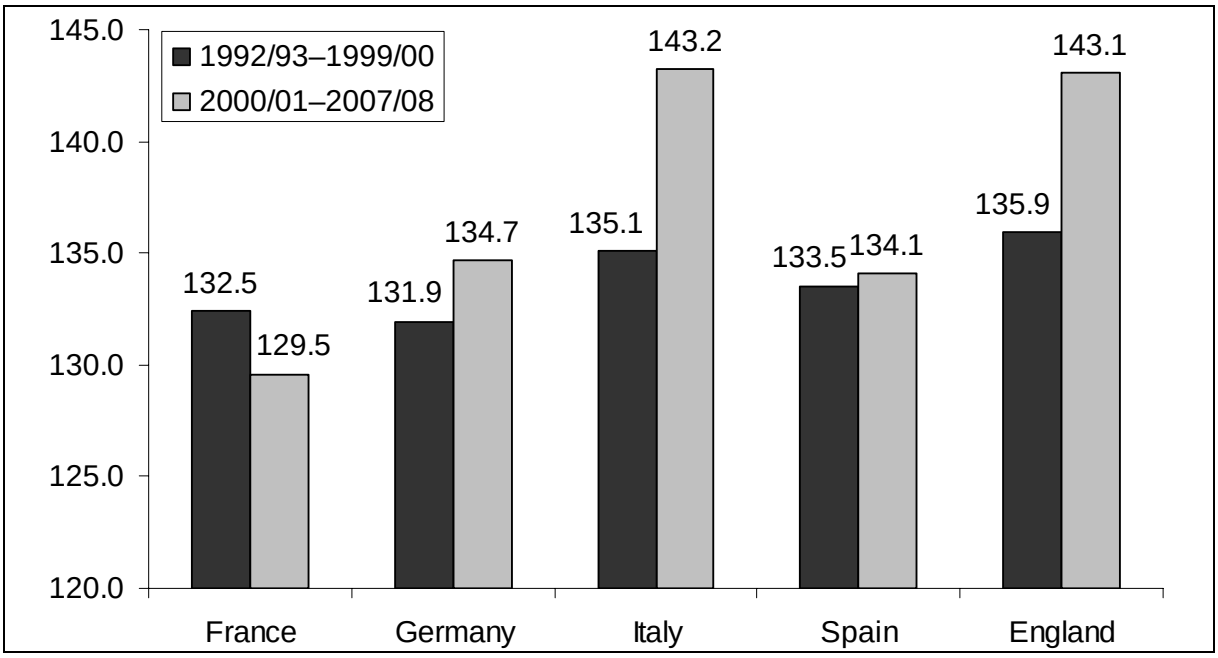

Figure 3: The average *C5-Index of Competitive Balance* in the European top leagues before and after the turn of the millennium.

To analyze the *within-team* component of CB requires a focus on individual team identities. Since teams participating in the CL are of special interest, this section focuses on the top five teams in each league during the entire sample period (1992/93–2007/08) in terms of the total number of points won in the domestic leagues. The top teams in each league advance to pan-European competitions in the following season. These teams are in France: *Olympique Lyon*, *AS Monaco*, *Girondins Bordeaux*, *Paris St. Germain*, *AJ Auxerre*; in Germany: *Bayern Munich*, *Werder Bremen*, *Bayer 04 Leverkusen*, *Borussia Dortmund*, *Schalke 04*; in Italy: *Juventus Turin*, *Inter Milan*, *AC Milan*, *AS Rome*, *Lazio Rome*; in Spain: *Real Madrid*, *FC Barcelona*, *Deportivo La Coruña*, *FC Valencia*, *Athletic Bilbao*; and in England: *Manchester United*, *Arsenal London*, *FC Chelsea*, *FC Liverpool*, *Aston Villa.* As might be expected, most of these top clubs also participate regularly in the CL (see table 1).

Table 1: The distribution of domestic CL qualification places to clubs (focus: year of qualification, x = direct qualification for the CL group stage in the following year; o = CL qualification, no qualification for the CL group stage).

CL qualification	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	∑
Bayern Munich		x			x	x	x	x	x	x	x	x	x	x		x	12
Bor. Dortmund			x	x	x		x		x	x	o						7
Bayer Leverkusen					x		x	x	x	x		x					6
Werder Bremen	x											x	x	x	x	x	6
FC Schalke 04									x				x		x	o	4
VfB Stuttgart											x				x		2
Hamburger SV								x						x			2
1. FC K'lautern						x											1
Hertha BSC Berlin							x										1
1860 Munich								o									1
Manchester Unit.	o	x		x	x	x	x	x	x	x	x	x	x	x	x	x	15
Arsenal London						x	x	x	x	x	x	x	x	x	x	x	11
FC Chelsea							x				x	x	x	x	x	x	7
FC Liverpool									x	x		x	x	x	x	x	7
Newcastle United					x					x	o						3
Blackburn Rovers			x														1
Leeds United								x									1
FC Everton													o				1
Juventus Turin			x	x	x	x		x	x	x	x	x	x			x	11
AC Milan	x	x		x			x	x		x	x	x	x	x	x		11
Inter Milan						x		o		x	x	x	x	x	x	x	9
AS Rome									x	x		x		x	x	x	6
Lazio Rome							x	x	x		x				x		5
AC Florence							x							o		x	3
AC Parma					x		o		o								3
Udinese Calcio													x				1
Olympique Lyon							o	x	x	x	x	x	x	x	x	x	10
Ol. Marseille							x				x				x	x	4
AS Monaco	x				x			x			x	x	o				5
Giron. Bordeaux							x							x		x	4
Paris St. Germain		x			x			x				x					4
OSC Lille									x				x	x			3
FC Nantes			x						x								2
AJ Auxerre				x						x							2
Racing Club Lens						x				x							2
FC Metz						o											1
FC Toulouse															o		1
Real Madrid			x		x	x	x	x	x	x	x	x	x	x	x	x	13
FC Barcelona	x	x			x	x	x	x	x	x		x	x	x	x	x	13
FC Valencia							x	x		x		x		x	x		6
Dep. La Coruña								x	x	x	x	x					5
Atlético Madrid				x												x	2
FC Villarreal													x			x	2
Real CD Mallorca							o		x								2
FC Sevilla															x		1
RS San Sebastián											x						1
Celta Vigo											x						1
Betis Sevilla													x				1
Atletic Bilbao						x											1
CA Osasuna														o			1

Table 2 summarizes the Markov transition probabilities for each league. Due to the limited number of CL qualification places (e.g. 2007/08: 1st–3rd place in Germany and France; 1st–4th place in England, Spain and Italy), the probability that a team will go from not being in the CL in one season to being in the CL in the next season is quite low (P_{oi} <.10). This probability remains relatively constant in before and after the change in payments for all leagues. In a balanced league every team has the same chance of being in the CL in season t+1, regardless of its performance in t, i.e. $P_{oi} = P_{ii}$. From Table 2, this is not the case. With the exemption of France in the period 1992/93–1999/00 (P_{ii} =.077), the probability that a team repeated qualification for the CL is far larger than 0.3. Furthermore, this probability increased dramatically after the turn of the millennium. For example, the probability that a team in the English Premier League repeated qualification for the CL is .844 in the period 2000/01–2007/08 and only .538 in the earlier period.

Table 2: Estimated transitional probabilities before and after the CL modification.

League	Transitional probabilities	1992/93–1999/00	2000/01–2007/08
Germany	P_{ii}	0.375	0.600
	P_{io}	0.625	0.400
	P_{oi}	0.079	0.069
	P_{oo}	0.921	0.931
England	P_{ii}	0.538	0.844
	P_{io}	0.462	0.156
	P_{oi}	0.042	0.031
	P_{oo}	0.958	0.969
Italy	P_{ii}	0.375	0.625
	P_{io}	0.625	0.375
	P_{oi}	0.079	0.079
	P_{oo}	0.921	0.921
France	P_{ii}	0.077	0.500
	P_{io}	0.923	0.500
	P_{oi}	0.090	0.077
	P_{oo}	0.910	0.923
Spain	P_{ii}	0.500	0.594
	P_{io}	0.500	0.406
	P_{oi}	0.056	0.081
	P_{oo}	0.944	0.919

To compare leagues of different sizes, we normalized the total number of points won by clubs to a standardized league of 18 teams where each team plays 34 matches [4]. Based on this normalization, we calculate the standard deviation of team points across season, shown in figure 4. From figure 4, we can observe an increase in CB in France and Germany, while the CB level in England and Spain remained constant. Based on these results, the top five clubs in France and Germany showed increased persistence in the standardized number of points earned in the later observed period. Only Italy experienced a significant increase in the variability of points earned. While we considered the relegation of Juventus Turin, the results in Italy reflect the additional deduction of points for Lazio Rome and AC Milan in 2005/06 due to the match fixing scandal.

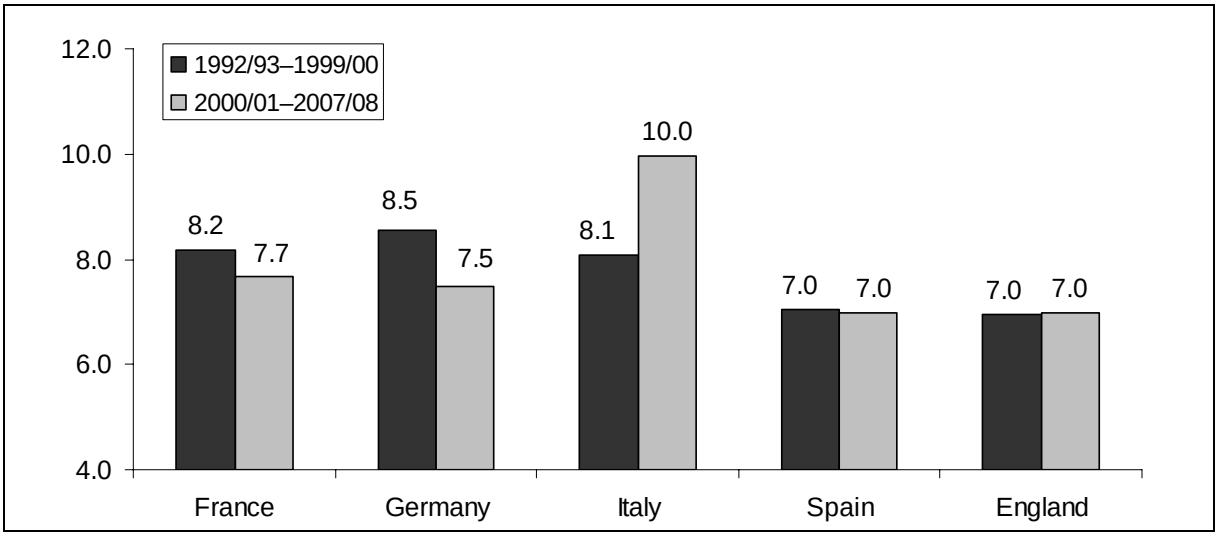

Figure 4: The *within-team component* of the top five clubs in the European top leagues before and after the turn of the millennium.

The average *standard deviation of league points* and its differences across the 1992/93–1999/00 and 2000/01–2007/08 periods are shown on figure 5. Based on this figure, the average number of points won by the top five clubs compared with the

rest of the teams in each league increased in the later period. This effect is most obvious in the Italian and the English first divisions.

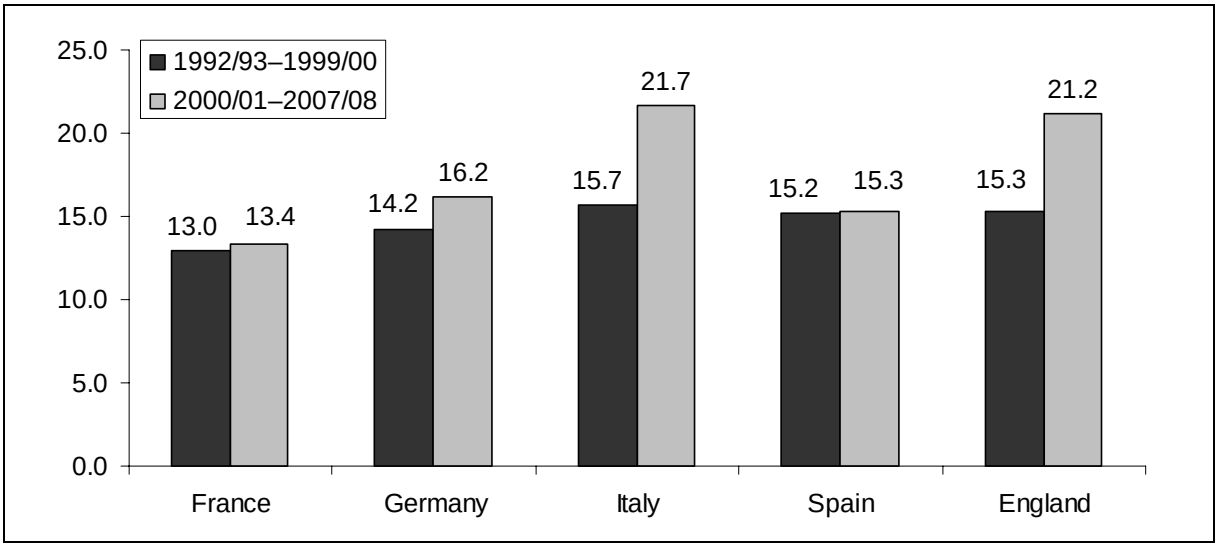

Figure 5: The *within-season component* of the top five clubs in the European top leagues before and after the turn of the millennium.

Based on the average *standard deviation of team points* (*within-team* component) and the average *standard deviation of league points* (*within-season* component), we can calculate the CBR, shown on figure 6.

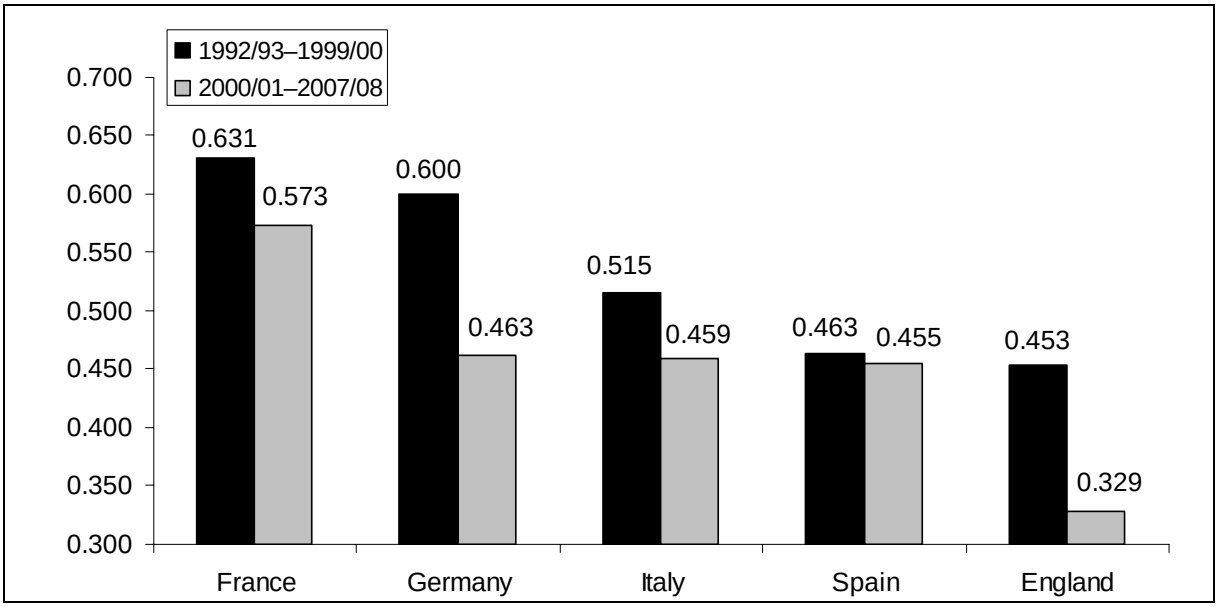

Figure 6: The *CBR* of the top five clubs in the European top leagues before and after the turn of the millennium.

Based on the CBR, a distinct difference before and after the turn of the millennium can be seen in all of the domestic leagues. Based on these findings, CB in all the domestic leagues decreased as the top clubs repeated their good performance season after season and/or the difference between the performance of the top clubs and the other league competitors within a season increased over time. The declines in England and Germany were particularly large.

Summing up, most of the metrics point to a decrease in CB after the CL payouts increased. Thereby, the transition probabilities match the CBR results. This decrease appears to be more significant in England, Italy and Germany compared to Spain or France.

5. Discussion and Conclusion

With due regard to the methodical limitations discussed above, the study contains clear evidence of a persistent decline of competitive balance in the five domestic leagues analyzed since the turn of the millennium. The change in the CL payout structure appears to be an important source of this reduction in competitive balance, based on the timing of the payout change. This negative impact could become more significant in the future, since CL TV revenues are expected to increase by around 30 percent in the near future and the principle underlying the distribution of revenues in the CL creates a vicious cycle (or blessing, depending on your perspective). Successful clubs obtain ever-increasing payouts from persistent CL appearances, which allow them further dominate domestic league competitions, in turn increasing the probability of appearing in the CL again in the future. The revenue distribution mechanism also benefits the top five leagues examined here, since these leagues also play in the largest television markets in Europe. The current revenue distribution policy also allows teams from the top five leagues the possibility of obtaining

relatively high bonuses even if they do not perform well. For example, in 2008/09 the clubs that participate in the UEFA CL group stage were expected to obtain at least around 15 million Euros. Nevertheless, as mentioned above, numerous other factors including increasing national media rights revenues, investor market entries, and successful internationalization efforts by European clubs, might also have had a lasting impact on the top clubs' performance in domestic football leagues. For instance, in contrast to other European countries, the broadcasting rights for football matches in Spain and Italy (as well as Greece and Portugal) have been marketed by individual clubs based on a decentralized system since the end of the 1990s. As a matter of fact, the ratio of the minimum to the maximum media rights revenues in a league with a uniform marketing model is around 50 percent while it is only 6 percent in Italy and 9 percent in Spain. In this context, the centralized model affords an added advantage over the decentralized model in that it can improve the competitive balance of domestic leagues.

In order to counter any further decline in competitive balance in domestic leagues, football's governing bodies should consider the possible ramifications of (re-) distribution of revenues generated by pan-European competitions within and across leagues. UEFA has announced (and partly implemented) a far-reaching reform of the CL and its payment distribution system in particular like the introduction of annual CL solidarity payments for youth development in clubs to the leagues of UEFA's member associations. For example, in total, 36.1 million Euros were distributed to leagues with participants in the 2008/09 UEFA group matches and 7.2 million Euros were distributed to leagues without participants in the 2008/09 UEFA group matches. This appears advisable and should be combined with the idea that all domestic leagues and national football associations be subject to the same standards in the future with

respect to club licensing, and for clubs to pursue the objective of maximizing their sporting success while giving due consideration to economic objectives. In some cases, club owners or presidents use private assets to cover losses. This is to the detriment of clubs that finance their payroll internally using existing cash flows. If one accepts the accuracy of press reports concerning clubs that have overdue liabilities to their players or other clubs in connection with transfers, such clubs are in clear contravention of the "A" criteria prescribed by the *UEFA Club Licensing Regulations*. This would mean that such clubs would have to be denied licenses. Furthermore, a uniform marketing model for media rights for all countries would also foster a more balanced national and pan-European competition.

However the exception in the top Italian league, increasing attendance figures since the turn of the millennium may mitigate the need for such regulations. Increasing attendance leads to increased revenues for all teams in domestic leagues, and could offset revenue disparities generated by CL payouts. Do fans care about the decline in CB in the top five European football leagues? Do different groups of fans exist that care more or less about the decline in CB in the top leagues? These are two relevant questions that need to be explored in future research.

Notes

[1] "The revenues that the [clubs] draw from the Champions League distort the domestic championship economic balance, since these revenues are bigger than the overall turnover of most domestic competitors (…)" (Andreff & Bourg, 2006, p. 37).

[2] In the German Bundesliga (season 2006/07), 1. FC Nürnberg finished in 6th position with 11 victories (and 15 draws) while Energie Cottbus finished in 13th

position also with 11 victories but with 8 draws. Examples like this indicate the potential biases when the winning percentage is applied.

[3] In 2008/09 the ‘group stage’ was made up by 32 teams and preceded by two qualification streams for teams that did not qualify directly. However, since only teams participating in the group stage have access to considerable revenues from the CL, our analysis is focused on this.

[4] By interpolating the total points won by Juventus Turin in 2005/06 to the season 2006/07, we try to consider approximately the (extraordinary) relegation of the club in 2005/06.

References

Andreff, W., & Bourg, J.-F. (2006). Broadcasting rights and competition in European football. In C. Jeanrenaud, & S. Késenne (Eds.), *The economics of sport and the media* (pp. 37–71). Cheltenham (UK) & Northampton MA (USA): Edward Elgar.

Bherends, E. (2000). *Introduction to Markov chains* (Advanced lectures in mathematics). Braunschweig: Vieweg.

Buzzacchi, L., Szymanski, S., & Valletti, T. M. (2001). *Static versus dynamic competitive balance: Do teams win more in Europe or in the USA?* (Economics Group Discussion Paper Series, No. 2001.03). London: Imperial College Management School.

Buzzacchi, L., Szymanski, S., & Valletti, T. M. (2003). Equality of opportunity and equality of outcome: Open leagues, closed leagues and competitive balance. *Journal of Industry, Competition and Trade, 3*(3), 167–186.

Cairns, J. P. (1987). Evaluating changes in league structure: The organisation of the Scottish football league. *Applied Economics, 19*(2), 259–275.

Cairns, J. P., Jennett, N., & Sloane, P. (1986). The economics of professional team sports: A survey of theory and evidence. *Journal of Economic Studies, 13*(1), 3–80.

Depken, C. A. (1999). Free-agency and the competitiveness of Major League Baseball. *Review of Industrial Organization, 14*, 205–217.

Dietl, H., & Franck, E. (2005). Effizienzprobleme in Sportligen mit gewinnmaximierenden Kapitalgesellschaften. Eine modelltheoretische Untersuchung. In M.-P. Büch, & H. Schellhaaß (Eds.), *Ökonomik von Sportligen* (pp. 29–52). Schorndorf: Hofmann.

Drewes, M. (2003). Competition and efficiency in professional sports leagues. *European Management Quarterly, 3*, 240–252.

Eckhard, E. W. (1998). The NCAA cartel and competitive balance in college football. *Review of Industrial Organization, 13*(3), 347–369.

Feddersen, A. (2005). *Steuerungsmöglichkeiten der Wettbewerbsintensität von Sportligen: Eine ökonomische Analyse sportpolitischer Regulierungen* (Dissertation). Universität Hamburg, Department Wirtschaftswissenschaften.

Feddersen, A. (2006*). Economic consequences of the UEFA Champions League for national championships – the case of Germany.* (Hamburg Working Paper Series in Economic Policy, 01/2006). Universität Hamburg, Department Wirtschaftswissenschaften.

Feddersen, A., & Maennig, W. (2005). *Trends in competitive balance: Is there evidence for growing imbalance in professional sport leagues?* (Hamburg Contemporary Economic Discussions, 01/2005). Hamburg: University of Hamburg, Faculty Economics and Social Science.

Frick, B. (2007). The football players' labor market: Empirical evidence from the major European leagues. *Scottish Journal of Political Economics, 54*(3), 422–446.

Goossens, K. (2006). Competitive balance in European football: Comparison by adapting measures: National measure of seasonal imbalance and top 3. *Rivista di Diritto ed Economia dello Sport, 2*(2), 77–122.

Groot, L.F.M. (2008). *Economics, uncertainty and European football: Trends in competitive balance.* Cheltenham (UK) & Northampton MA (USA): Edward Elgar.

Hadley, L., Ciecka, J., & Krautmann, A. C. (2005). Competitive balance in the aftermath of 1994 players' strike. *Journal of Sports Economics, 6*(4), 379-389.

Hall, S., Szymanski, S., & Zimbalist, A. S. (2002). Testing causality between team performance and payroll. The case of major league baseball and English soccer. *Journal of Sports Economics, 3*(2), 149–168.

Haugen, K. K. (2008). Point score systems and competitive imbalance in professional soccer. *Journal of Sports Economics, 9*(2), 191–210.

Humphreys, B. R. (2002). Alternative measures of competitive balance in sports leagues. *Journal of Sports Economics, 3*(2), 133–148.

Késenne, S. (2000). Revenue sharing and competitive balance in professional team sports. *Journal of Sports Economics, 1*(1), 56–65.

Késenne, S. (2006). The win maximization model reconsidered. Flexible talent supply and efficiency wages. *Journal of Sports Economics, 7*(4), 416–427.

Koning, R. H. (2000). Balance in competition in Dutch soccer. *The Statistician, 49*(3), 419–431.

Leeds, M. & van Allmen, P. (2005). *The economics of Sports* (2nd). Boston: Pearson.

Michie, J., & Oughton, C. (2004). *Competitive balance in football: Trends and effects*. (Research Paper 2004 No. 2). London: University of London, Football Governance Research Centre.

Noll, R. G. (2002). The economics of promotion and relegation in sports leagues. The case of English football. *Journal of Sports Economics, 3*(2), 169–203.

Rottenberg, S. (1956). The baseball players' labor market. *Journal of Political Economy, 64*(3), 242–258.

Sanderson, A. R. (2002). The many dimensions of competitive balance. *Journal of Sports Economics, 3*(2), 204–228.

Szymanski, S. (2001). Income inequality, competitive balance and the attractiveness of team sports: Some evidence and a natural experiment from English soccer. *The Economic Journal, 111*, F69–F84.

Zimbalist, A. (2003). Reply: Competitive balance conundrums. Response to Fort and Maxcy's comment. *Journal of Sports Economics, 4*(2), 161–163.