

Football clubs' sports performance in the context of their market value and GDP in the European Union regions

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Abstract. The aim of the study is to evaluate the relationship between the sporting success of football clubs, their market value and the economic performance of the regions they are located in. All member states of the European Union are under consideration, taking into account the success of the clubs in the highest-ranked male national football competitions and in European cups. The data are processed at NUTS 2 level over a period of one decade (2007–2016). From a methodological point of view, it is beneficial to construct original indexes of clubs' sporting performance – both at the national level, and an overall one that also takes into account results in international (European) competition. To determine the existence of a link between the sporting performance of the club, its market value and the economic performance of the regional level unit it is located in (measured by gross domestic product), correlation and regression analysis is utilised. For example, the results show a high positive statistical link between a club's sporting performance and its market value, but a relevant direct statistical link has also been confirmed between the economic performance of the region and the market value of the club, with respect to its sporting success. However, the analysis also showed that the club of a relatively poor region (from a pan-European point of view) could reach above-average results at the highest European level, and vice versa – a club with a high market value, from an economically highly over-developed region, could lag behind.

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1. Introduction

There are many studies in the world in the field of sports or football economics, and not only from the geographic point of view. Football is one of the largest sports phenomena currently being debated not only by law but also by the professional public. We can only agree with the claim that professional sport, given its social, cultural and economic significance, is a legitimate area of interest for theoretical and empirical researchers (Dobson and Goddard, 2001).

These debates are increasingly also pursuing the economic aspect of the issue, as finance is more than an important factor behind success or failure in the sporting sphere. The link between economics and sport dates back to the 1950s when Simon Rotenberg, with his publication in 1956, oversaw the birth of sport economy (Noll, 2006). In the 21st century, we have seen a huge development in sport financialisation (Szymanski, 2010). Soccer teams are becoming firms, players from all over the world earn more per day than fans do in a year. Even those aspects of the changes in football, in both the game itself and the functioning of the club, were brought to the foreground by Morrow (2003).

Castellanos and Sánchez (2007) focus on the economic value of the football club under Spanish conditions. They investigated the nature of measurable, but also unpredictable factors and, using calculations and different models, attempted to record the indirect effects of the football club on the host city and the metropolitan area. Roberts et al. (2016) examine the impact of Swansea City Premier League club on the regional economy. They discuss the extent to which the football club brings added value to the region. For decision-making about investing, the relevance of the given sport in a par-

ticular territory is a very important factor. The club can gain a strategic advantage by building a tradition and a favourable geographic position where input costs for the technical infrastructure are minimal, but in the absence of these comparative advantages, the environment suitable for the sport is developed – just very slowly. The presence or absence of a competitive club in a territory is also important – for a football club, it is important to know whether it has a monopoly or not in a certain territory (Dejonghe, 2004). For the overall economic growth of the region, the presence of a professional sports or football club has mostly minimal direct impact. However, a professional sports club makes a town more attractive to tourism; it is able to use the finance from the taxing of the athletes, owners, and even from the club's business as such (Siegfried and Zimbalist, 2006). Marketing and sponsorship are also very important for a club's operation. It is the sponsors that really influence the financial capacities of the club. The number of sponsors and their investment activity greatly influence the location in which the club operates. However, this form of cooperation brings benefits to both sides in the form of increased revenue through the sale of souvenirs, tickets, TV rights, etc. The sponsor can feel the effect of advantageous cooperation, for example, by increased sales of products, rising prices or enhanced branding and a stronger market position (Pracejus, 2004).

Forrest and Simons (2002) found that attendance was very positively affected by competition between teams of comparable sporting performance and thus the uncertainty of the match result. It is also positively influenced by the quality of the club or league as such. In addition, the above-mentioned authors also discuss the economic benefits of spectators in sport, focusing on English football. Naghshbandi et al. (2011) focused on the top competitions in six

countries, comparing teams and their similarity in sports performance – a factor of particular importance for the attractiveness of the league. The more balanced the league is, the more attractive it is for fans and TV viewers, thus generating more money, while if there was a monopolising club without more competition, the club and league would lose their attractiveness and the financial turnover would start to decrease rapidly. Dobson and Goddard (2001) argue that attendance has been affected by a number of factors over time: social and demographic changes, income levels of the population, availability of football broadcasts on television and internet, rowdies, stadium infrastructure, and of course the quality of the football itself.

The gradual development of football's professionalism has been closely linked to growth in football revenues, but also to the player market, and the sports and technical infrastructure. However, without traditional methods of commercial and financial management, professional football clubs seem virtually unsustainable due to new challenges related to modernisation resulting from social and economic changes. In the first half of the 20th century, football gradually began to commercialise, but its role in the business world has grown enormously in the last few decades. The economic structure of football adapted to changes such as the abolition of the maximum wage or the introduction of freedom of contract. During the 1970s and 1980s, however, football was also influenced by other trends. It fought against hooligans and a significant drop in attendance at stadiums. By the late 1980s and early 1990s, the pace of change in the economic sphere had accelerated dramatically as a result of the trading of TV rights, sponsorship and merchandising. Since the beginning of the new millennium, the unequal distribution of wealth and thus the loss of competitiveness in economically less advanced countries or clubs has been the most discussed topic (Dobson and Goddard, 2001). Szymanski (2010) describes the development of the economic dimension of football on the example of England, a country that has been investing in football for the longest time. Attendance in the four highest English competitions declined significantly between 1949 and 1986. The 41 million fans at the beginning of the period dropped to 16.5 million. But then there was a break – a lot of money was invested in foot-

ball. Spectator comfort increased, advertising rapidly developed and the most popular game in the world came back to the fore. When observing the current situation in the football economy, we can summarise some basic trends. In recent years, player earnings have increased several times, television contracts have yielded revenue at an unpredictable scale, stadiums have been completely refurbished, money from sponsorship and merchandising has increased dramatically, and many clubs have started operating on the stock market (Dobson and Goddard, 2001).

There have been two major changes in European football in recent decades. Firstly, the international trade in football talents has expanded considerably. Secondly, international competitions such as the Champions League have gained enormous importance in the football world. It was just the introduction of the UEFA Champions League in 1992 (marketing successor of the European Cup) and the Bosman Rules of 1995 (after the expiration of the contract and having turned twenty-four years of age, players can freely change club) that significantly changed not only European, but also world football. The (relative) balance in sports performance between clubs at national and international level was disturbed (Haan, 2012).

Restoration of the management of European competitions and the creation of a multi-team format were the main points in the expansion of the European football market to increase the interest of fans, sponsors and media partners. This is how a major marketing successor to the European Cup emerged – the UEFA Champions League, the main competition among the European largest clubs since 1992. This competition has resulted in a significant increase in revenue for UEFA, the governing body of European football representing national football associations in Europe, organising pan-European club competitions, and overseeing the sporting part, but also finance, regulations and media rights. On the same principle, the European League (EL), the second most important club competition in Europe, was developed in 2009 (Dima, 2015). The enormous increase in the revenues of contestants in European competitions also affects competitiveness at the national level. For any club competing in European cups, this gives a huge financial advantage over

clubs operating only in national competitions (Pawłowski et al., 2010).

In our contribution, we would like to come up with comprehensive results describing the relationship between the economic development of the regions and the presence of major football clubs, in the EU. In view of the above, it can be assumed that football clubs from richer regions will ultimately be more successful than clubs from economically average or below-average ones.

2. Dataset and research methods

At the beginning of the research, we needed to prepare a comprehensive database that, by applying relevant processing methods, would produce results describing the relationship between the economic development of a particular territory and the presence of a football club described by certain (sporting and economic performance) characteristics. The database consisted of two sets of main variables, namely statistics of football clubs (sporting performance measured by indexes of a club's sporting performance, and economic status measured by the club's market value) and statistics of economic performance (measured by GDP) of the regions where clubs operate (we worked with NUTS 2 regions). The monitored period covered 10 years, i.e. 2007/08 to 2016/17, respectively, and for the national leagues played during one calendar year we chose 2007–2016. For these individual seasons we also needed to reconcile the data of the other variables examined.

Due to the enormous amount of data we decided to analyse only first-league football clubs. We processed the data for EU countries in which a first-class football competition (men) is held. In our database, up to 33 competitions were found across 28 EU countries, with several top competitions in certain countries. These are: the UK, where the English, Welsh, North, Scottish, and Gibraltar first-league competitions are played; and in Denmark which holds the top competitions of Denmark and the Faroe Islands. In addition, it is worth mentioning that there is also a Monaco club, a city that plays in the French league competition. As a result of applying the above criteria, every team playing at least

one first-class competition between the 2007/08 and 2016/17 seasons appeared in our database. We obtained the data from www.transfermarkt.com or if we were lacking data, we used the www.soccerway.com portal. The database comprised a total of 820 unique football clubs.

The attributes we watched at the level of football clubs included their sporting success (i.e., the placement in domestic or European competition in each season) as well as the selected indicator of their economic status (the market value of the club in each season) (www.transfermarkt.com). We also followed the ranking of each national league by UEFA, based on the success of clubs by country in competitions organised by UEFA (UEFA Champions League and European League). National ranking is determined as the average of the points earned by clubs of a certain country participating in European competitions during the season. Thanks to this, we took into account the quality of each national league and thus the “weighting” of the placement in each national league (from the point of view of sports performance, it is more difficult to be the champion of the season in, for example, England or in Spain, than to win the league in Latvia or Slovakia). In addition to the performance in the national league, the success of the clubs in the European competitions (cups) is also important. We therefore also considered the UEFA ranking – this time we assigned points to each team for their performance in European competitions, if any (a club gets points for qualifying, for each subsequent round of the competition they advance to, and for each point won within the competition's own points system). We obtained these data from www.uefa.com and we also updated them as previously for each season separately.

For every club in the database we also found the city/town in which it operates (if it was not clear from its name). We used the city/town attribute to include each club in the NUTS 2 region database. We obtained the current NUTS 2 region database from www.ec.europa.eu. From Eurostat, we also added GDP data for the regions concerned in the particular years. We used multiple features in Microsoft Excel (CONCATENATE, VLOOKUP) to process a complete database so that we could reconcile data from multiple sources by location and by specific time.

In the first phase, we counted the club's national sports performance index, which reflects its sporting success in a given season (regardless of whether or not it took part in European competitions in that season). We defined a relationship:

$$Ic_{ls} = \frac{(Nc_{ls} - Rc_{ls}) + 1}{Nc_{ls}} \times Cc_s$$

Ic_{ls} = National Sports Performance Index of the Club in the context of the national ranking in the league l and in the season s

Nc_{ls} = number of clubs in league l in season s

Rc_{ls} = club rank in league l in season s

Cc_s = country coefficient in season s (according to UEFA)

In the first place, we had to take into account the fact that the number of clubs is different in individual leagues, and the number of clubs sometimes changed during the seasons. Winning in a league of 12 teams (for example, the Scottish League in 2016/2017) is not as difficult as in a league of 20 teams (e.g. the English Premier League in 2016/2017). Each club in a particular league gained a score according to the position in that season. To take account of the different number of clubs in the leagues, we put the final position (within the season) in ratio with the total number of clubs in the league. For example, the score for Bayern Munich, the German Bundesliga winner in the 2016/2017 season, was $1.0 \left(\frac{(18-1)+1}{18} \right)$ and for Darmstadt 98, the last team of the season, the value was $0.06 \left(\frac{(18-18)+1}{18} \right)$. Since it is necessary to take into account the quality of the league in the given season as well, we weighted the score by national coefficient (Cc_s). We called the result the *National Sports Performance Index of the Club* (Ic_{ls}).

In the second relationship, taking into account the quality of the league and the final position, we also considered the results achieved by the club in European competitions. We added a coefficient to the given club in the European Competitions (ECc_s) season. The result is the *Total Sports Performance Index of the Club* (Tic_{ls}), which for every club in each season gives us the value of success, taking into ac-

count the final position in the national league, the quality of the league, and success in international competition, i.e. European competitions.

$$Tic_{ls} = \frac{(Nc_{ls} - Rc_{ls}) + 1}{Nc_{ls}} \times Cc_s + ECc_s$$

Tic_{ls} = Total Sports Performance Index of the Club in the context of the national ranking in league l and in season s , even with the score for performance in European competitions

Nc_{ls} = number of clubs in league l in season s

Rc_{ls} = club rank in league l in season s

Cc_s = country coefficient in season s (according to UEFA)

ECc_s = club coefficient for European competitions in season s (according to UEFA)

The above-mentioned relations were used in statistical analysis, the results of which are presented in the empirical part of the work.

3. Results

Before we apply the aforementioned relationships in statistical and spatial analyses, it is interesting to point to the difference in levels of quality between individual leagues in the EU. Table 1 shows the average of the national coefficient for the period 2007 to 2016. This is the order of quality of the individual leagues in the EU countries. Of the Top 5 leagues, the French league is qualitatively the worst, which has recently been marked by the massive financialisation of the Paris Saint-Germain club, but this did not appear to raise the entire league, as the rest of the team is without any success compared to the narrow top (Garcia and Amara, 2013). As analysis showed, the Portuguese League is very close to the French League, with the Dutch and Belgian League lagging behind more pronouncedly. When comparing the best football clubs in the Top 6 European leagues by *National Sports Performance Index* (Ic_{ls}) for the period 2007–2016 (Table 2), we will see a significant difference in the quality of these leagues. For example, some leading clubs in the Portuguese or French League have coefficient values (Ic) much

lower than clubs in lower positions in La Liga, the English Premier League or the German Bundesliga. It should be noted that another important factor affecting the value of the club coefficient (I_c) in a season

or, respectively, for a given period, is the long-term success of clubs from particular leagues in European competitions, which also results in a higher national coefficient (C_c).

Table 1. Average value of the national coefficient in 2007–2016 in the leagues of EU countries

Order	Country/League	C_c_{07-16}	Order	Country/League	C_c_{07-16}	Order	Country/League	C_c_{07-16}
1.	Spain	18.92	12.	Austria	5.17	23.	Finland	1.69
2.	England	16.04	13.	Cyprus	4.40	24.	Ireland	1.59
3.	Germany	15.47	14.	Romania	4.39	25.	Latvia	1.18
4.	Italy	13.33	15.	Croatia	4.28	26.	Lithuania	1.07
5.	France	11.08	16.	Scotland	4.01	27.	Gibraltar	0.88
6.	Portugal	10.42	17.	Poland	3.97	28.	Estonia	0.79
7.	Netherlands	7.66	18.	Sweden	3.54	29.	Luxemburg	0.72
8.	Belgium	7.41	19.	Bulgaria	3.01	30.	Malta	0.72
9.	Greece	6.49	20.	Slovakia	2.66	31.	Northern Ireland	0.70
10.	Czechia	5.35	21.	Slovenia	2.02	32.	Wales	0.63
11.	Denmark	5.21	22.	Hungary	1.93	33.	Faroe Islands	0.51

Source: www.uefa.com + research results (authors' calculations)

Table 2. Comparison of the best football clubs in the Top 6 European leagues by $I_{c_{15}}$ for the period 2007–2016

La Liga	$I_{c_{07-16}}$	Premier League	$I_{c_{07-16}}$	1. Bundesliga	$I_{c_{07-16}}$
FC Barcelona	18.46	Manchester United	14.51	Bayern Munich	15.14
Real Madrid	18.13	Chelsea FC	14.35	RB Leipzig	13.76
Atlético Madrid	16.01	Arsenal FC	14.02	Borussia Dortmund	12.85
Sevilla FC	14.45	Manchester City	13.59	Bayer 04 Leverkusen	11.95
Villarreal CF	13.76	Liverpool FC	12.52	FC Schalke 04	11.43
Valencia CF	13.50	Tottenham Hotspur	12.52	VfL Wolfsburg	9.39
Athletic Bilbao	12.40	Everton FC	11.16	Borussia Mönchengladbach	9.18
Real Sociedad	12.21	Southampton FC	9.31	SV Werder Bremen	8.19
Celta de Vigo	11.30	Leicester City	8.57	Hamburger SV	7.54
Málaga CF	11.29	Fulham FC	7.47	VfB Stuttgart	7.52
Serie A	$I_{c_{07-16}}$	Ligue 1	$I_{c_{07-16}}$	Primeira Liga	$I_{c_{07-16}}$
Juventus FC	12.36	Olympique Lyon	10.02	FC Porto	10.01
AS Roma	11.58	Paris Saint-Germain	9.10	SL Benfica	9.97
Inter Milan	10.86	Olympique Marseille	9.05	Sporting CP	9.05
SSC Napoli	10.82	LOSC Lille	8.62	SC Braga	8.22
AC Milan	10.68	FC Girondins Bordeaux	7.88	Vitória Guimarães SC	6.91
ACF Fiorentina	9.65	AS Monaco	7.78	GD Estoril Praia	6.17
SS Lazio	9.13	Stade Rennais FC	6.88	CS Marítimo	6.15
UC Sampdoria	7.01	AS Saint-Étienne	6.70	CD Nacional	6.08
Udinese Calcio	6.98	HSC Montpellier	6.60	FC Paços de Ferreira	5.27
Torino FC	6.10	AJ Auxerre	5.94	Rio Ave FC	5.18

Source: research results (authors' calculations)

In the next part of the research we analysed the selected economic parameters for individual EU countries. In the first place, we compared the average market value of clubs (in EUR billions) for the 10 years under review (2007–2016) in all 33 EU leagues under investigation, and the average annual GDP (total in EUR trillions) over the period (Fig. 1). GDP was aggregated for those NUTS 2 regions where the first-league team was active at least once in the period under review. In addition to the countries with the most advanced football leagues (and at the same time the highest GDP), a higher GDP was also observed for the Netherlands, Sweden, Poland, Austria, Ireland and Finland, but the significant increase in economic productivity did not result in higher market values of football clubs. This may indicate, in particular, a lower interest in football compared to other sports in these countries. A high market value of clubs, despite the relatively “lower” GDP, is seen in England, which is affected by a number of factors (Szymanski, 2010). It is important to note the five best football leagues, whose clubs have definitely the highest market value. They are large states by both territory and number of inhabitants, with clearly the highest GDP values. Just this size difference has led smaller footballing countries to the idea of creating a so-called Atlantic League (Netherlands, Belgium, Scotland, Portugal, Norway, Sweden and Denmark), by which they

could compete jointly with populationally and economically stronger leagues (Dejonghe, 2004).

In addition to market value, we looked in more detail at the sporting performance of football clubs in the context of the GDP of the region these clubs operate in (Fig. 2). Given the economic performance of the regions, the clubs were less successful in France, Italy, and Germany in particular, while English, Spanish, Dutch, Belgian and Portuguese clubs achieved excellent results in the context of relatively lower regional GDP in 2007–2016.

Figure 3 shows that the economic crisis had minimal impact on the growth of the market value of clubs in Europe (Novotný, 2011).

We examined the spatial context concerning the economic performance of the regions, the market value of clubs and their sporting success. Figure 4 shows the average GDP value in NUTS 2 regions where the first-league football club was located at least once during the 2007–2016 season. Based on the results, the five richest regions achieved an average annual GDP of at least 200 billion EUR. These regions are located in Spain (*Cataluña*), Italy (*Lombardia*), Germany (*Oberbayern*) and France (*Rhône Alpes* and the absolutely richest region of *Île de France* with an average annual GDP of over 600 billion EUR).

In the spatial analysis of the average annual market value of clubs in NUTS 2 regions of the EU,

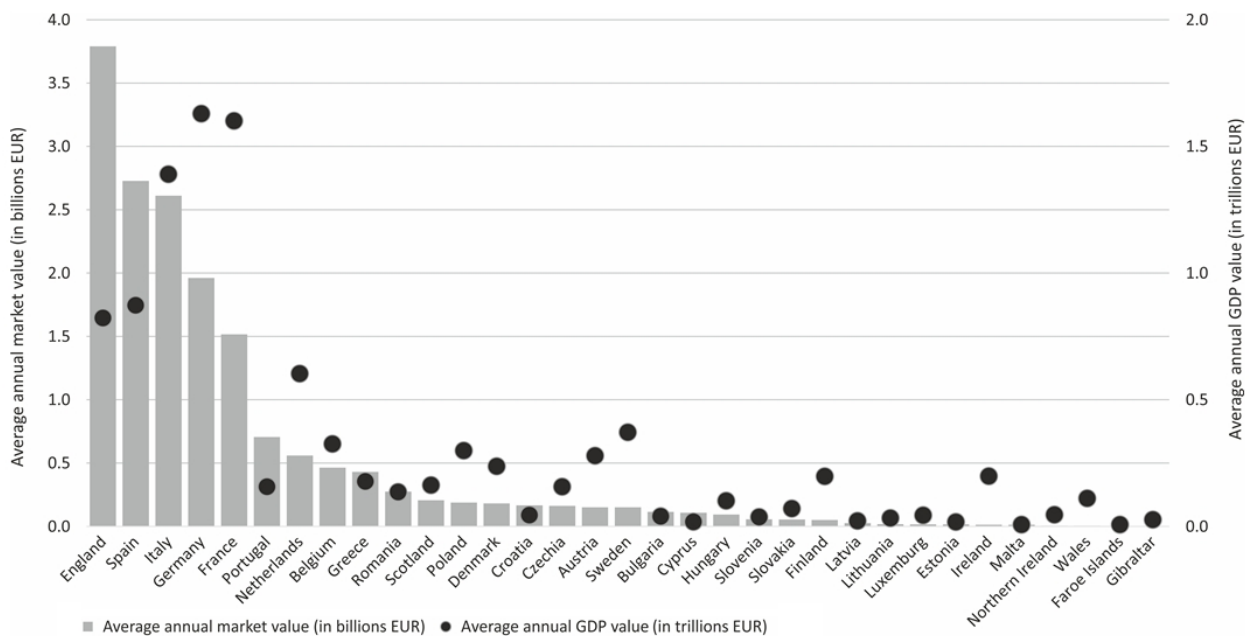


Fig. 1. Average annual market value of football clubs and average annual GDP of EU countries in 2007–2016
Source: research results (authors' calculations)

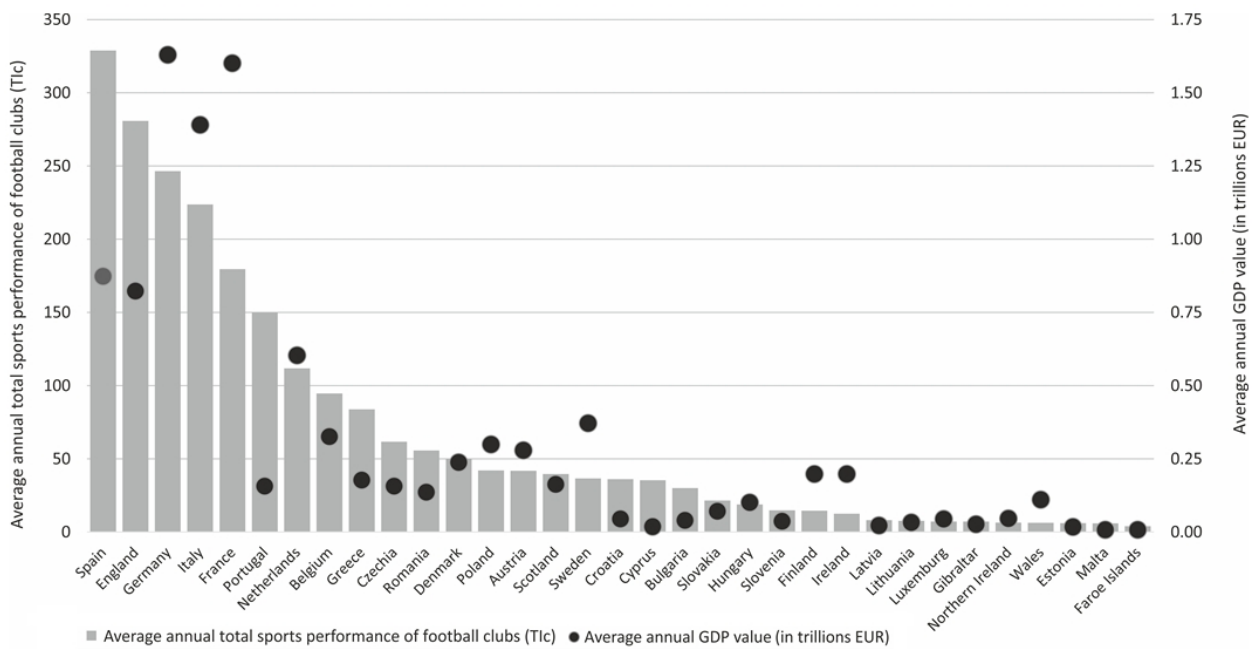


Fig. 2. Average Annual Total Sports Performance of Football Clubs (Tic) and Average Annual GDP of EU countries in 2007–2016

Source: research results (authors' calculations)

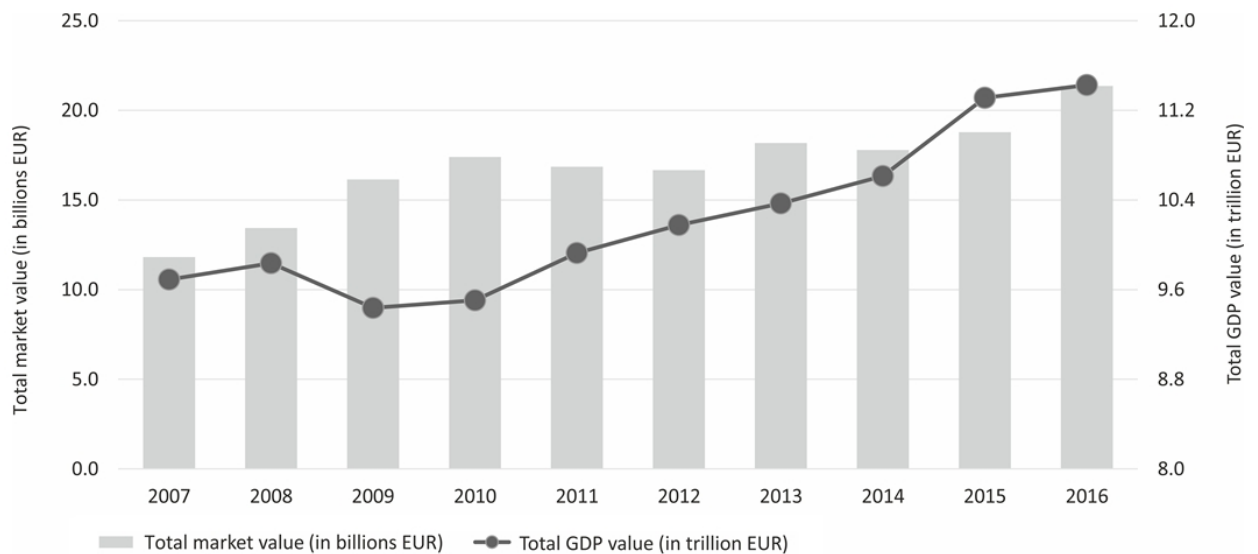


Fig. 3. Development of the total market value of football clubs and total GDP of EU countries in 2007–2016

Source: research results (authors' calculations)

it is possible to identify the dominance of Western Europe over Eastern Europe (Fig. 5). The regions with the highest market value of clubs are located in England, Spain, France, Germany and Italy (i.e. Top 5 countries according to the long-term national coefficient, see Table 1). In addition, we can observe the high market value of clubs in the Portuguese regions of *Norte* and in the region with the capital city of *Lisbon*. The Greek region of *Attiki* with the

capital of Athens is also very successful in this respect, from a relatively less economically developed area. Nevertheless, it is relatively successful to operate up to five clubs. Including the regions of the Spanish, French and Italian coasts of the Mediterranean Sea, we could also call this area a “*football crescent*” for its physical shape on a map of Europe. There are big clubs such as FC Sevilla, FC Valencia, FC Barcelona, Olympique Marseille, AS Mona-

co, FC Juventus, AC Milan, Inter Milan, AS Roma, and others. With the exception of a few regions, regions that were successful in football were also economically successful (Fig. 6). The figure also shows regions lagging behind in football – regions that did not have a first-league club during the period under review. Surprisingly this includes central France, as well as Spain, except for the centre with the capital *Madrid*. The unequal distribution of the market value of soccer clubs in England, as well as the footballingly and economically more advanced west of Germany compared to the east is also worth mentioning.

The last indicator we analysed in the NUTS 2 region was the calculated *Total Sports Performance Index of the Club* (TIC index) we surveyed on average for 2007–2016. We can observe the dominating area of the “*football crescent*”, a more successful Western Europe than Eastern Europe, and the dominance of regions with the highest TIC from Top 5 national football leagues. The highest index (both in domestic and European competitions) was achieved by the Spanish region of *Comunidad de Madrid* with a value of 94.1 for the whole period, Portuguese *Norte* (69.3) and the English regions of *Greater Manchester* (68.5) and *Inner London East* (63.0).

In the final part of the analysis we examined the dependence between the observed sporting and economic variables at the NUTS 2 level of the regions (Table 3). While the statistical dependences between the GDP level and the market value of the football clubs, and between the level of GDP and the success of football clubs both appear to be positive and moderate, a strong positive correlation was identified between the market value and the sports performance of the clubs. Based on the determination coefficient, we can claim that more than 80% of the success in the national league or in the European competitions is influenced by the market value of the club.

Interesting results can be found in the dependency graphs (Figs 7–9) showing, among other findings, the regions that have somehow “skipped” the rules of linear regression. The *Île de France* region (Paris Saint-Germain) shows a high annual GDP, but the average annual market value of the clubs is “lagging behind” (Fig. 7). The direct dependency of the indicators is closer to *Lombardia* (AC Milan, Inter Milan and Atalanta BC), *Cataluña* (FC Barce-

lona and RCD Espanyol Barcelona) and *Inner London West* (Chelsea FC, Fulham FC and Queens Park Rangers). Conversely, the relatively lower GDP, but high market value of clubs was observed in *Greater Manchester* (Manchester United, Manchester City, Bolton Wanderers and Wigan Athletic), *Comunidad de Madrid* (Real Madrid, Atlético Madrid, Getafe CF and Rayo Vallecano) and *Inner London East* (Arsenal FC, Tottenham Hotspur and West Ham United).

When comparing the sports performance of the clubs with the GDP values (Fig. 8), *Île de France* (Paris Saint-Germain), as well as partly *Oberbayern* (Bayern Munich) and *Lombardia* lag behind. On the other hand, regions of Spain (*Cataluña*, *Andalucía* with clubs Sevilla FC and Málaga CF, and *Comunidad Valenciana* with clubs Valencia CF and Villarreal CF), Portugal (*Area Metropolitana de Lisboa* with clubs SL Benfica and Sporting CP, and the region *Norte* with clubs FC Porto, SC Braga or Vitória Guimarães SC) and England (*Greater Manchester* and *Inner London East*) are typical of high sporting success at relatively low GDP levels. From this point of view, the leader has become *Comunidad de Madrid*, thanks, in particular, to the football clubs of Real Madrid and Atlético Madrid, which in the recent period have been successful not only in national but also European competitions.

The strongest statistical relationship was proven at regional level between the market value of clubs and their sporting success measured by TIC index (Fig. 9). Against this background, some Portuguese and Spanish regions (*Área Metropolitana de Lisboa*, *Norte*, *Andalucía* and *Comunidad Valenciana*) are predominantly successful, despite the relatively low market value of the clubs. Conversely, a relatively poorer sports performance at a relatively high market value was observed in the English regions (*Merseyside* with Liverpool FC and Everton FC and *Inner London West*). *Madrid* clubs raised the region's market value for clubs to a high level, and its sporting success has gradually increased as well. Interestingly, in the long run, wealthier clubs from England (*Greater Manchester* and *Inner London East*) have a comparable level of sporting success to clubs from the *Norte* region of Portugal. It is particularly interesting to look for the influence of FC Porto's long-term success in the national league as well as in European competitions.

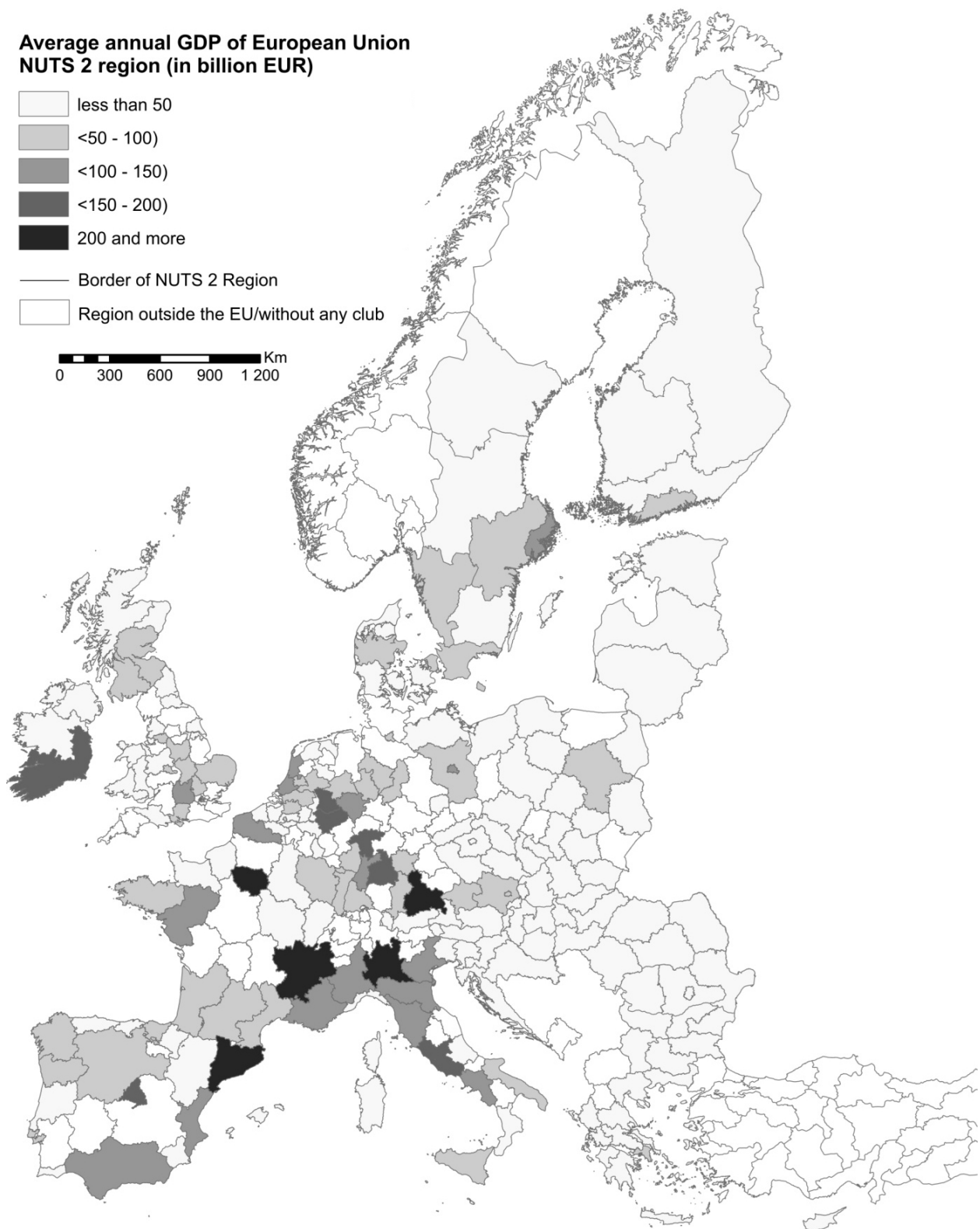


Fig. 4. Average annual GDP of European Union NUTS 2 regions in 2007–2016

Source: research results (authors' calculations)

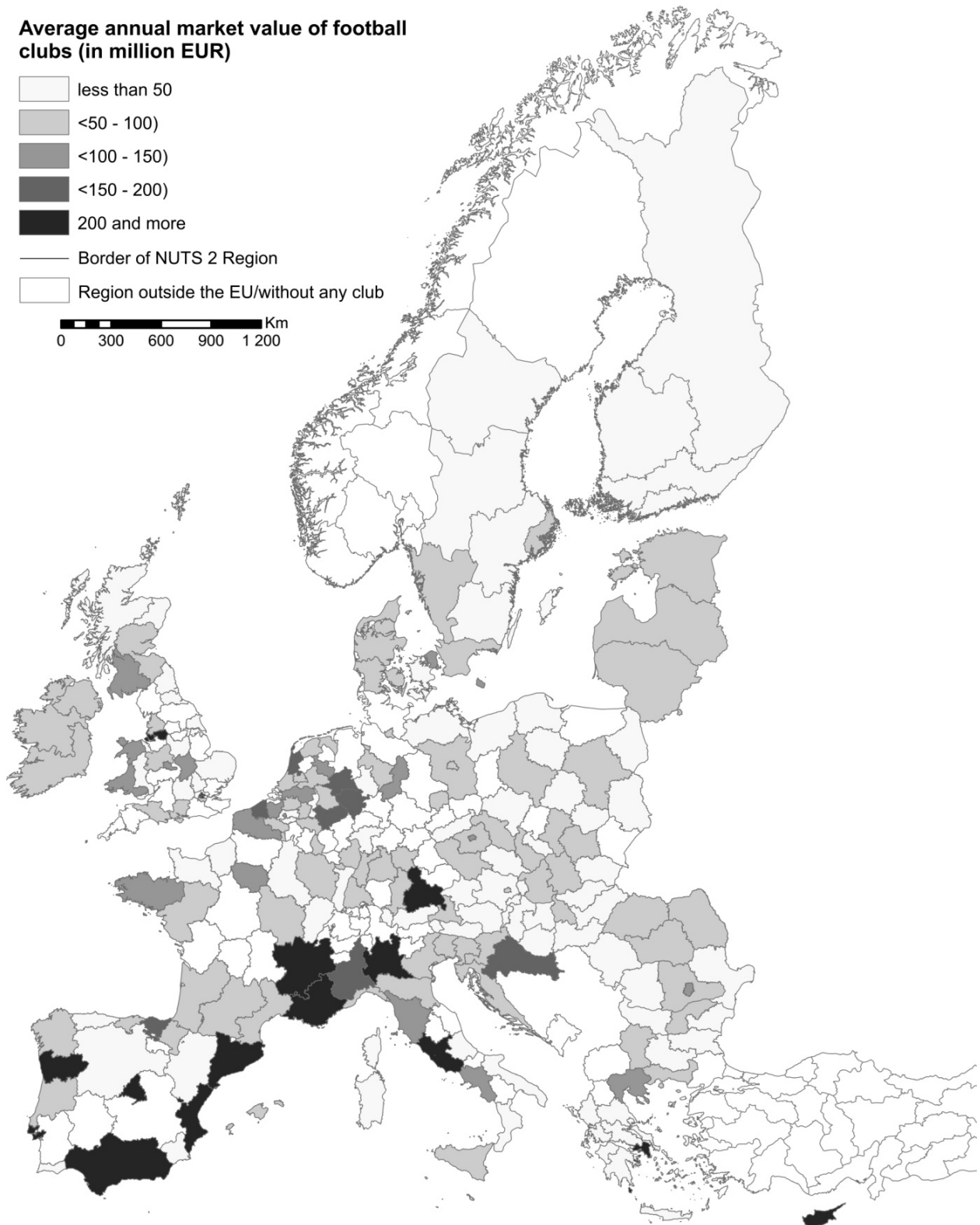


Fig. 5. Average annual market value of football clubs in European Union NUTS 2 regions in 2007–2016
 Source: research results (authors' calculations)

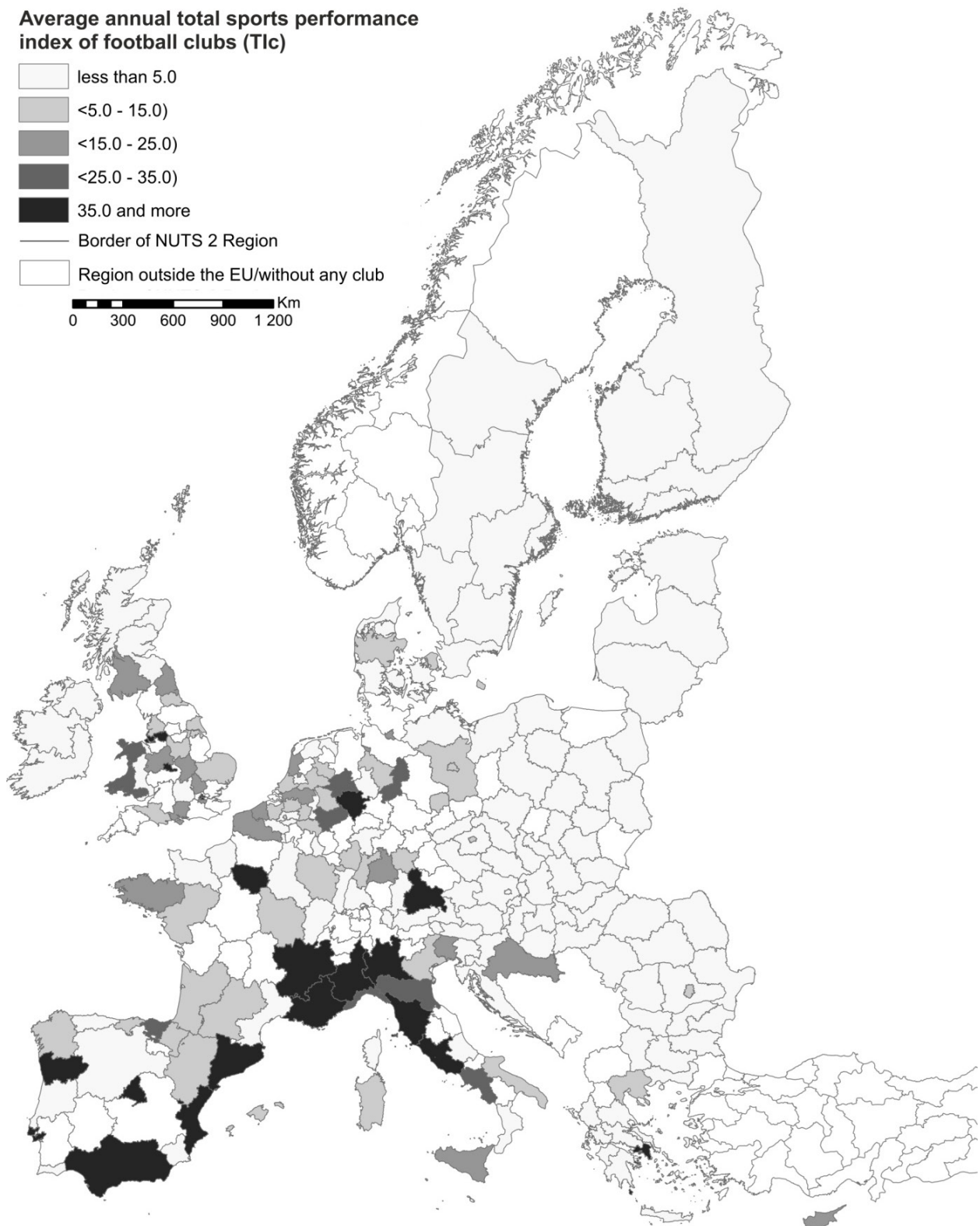


Fig. 6. Average annual total sports performance index of football clubs (Tic) in European Union NUTS 2 regions in 2007–2016

Source: research results (authors' calculations)

Table 3. Correlation between selected indicators of sports and economic performance within European Union NUTS 2 regions in 2007–2016

R (Pearson)	GDP value	Market value	TIc value	R ² (Coefficient of determination)	GDP value	Market value	TIc value
GDP value	-	0.5546	0.5018	GDP value	-	0.3076	0.2519
Market value	0.5546	-	0.9014	Market value	0.3076	-	0.8125
TIc value	0.5018	0.9014	-	TIc value	0.2519	0.8125	-

Source: research results (authors' calculations)

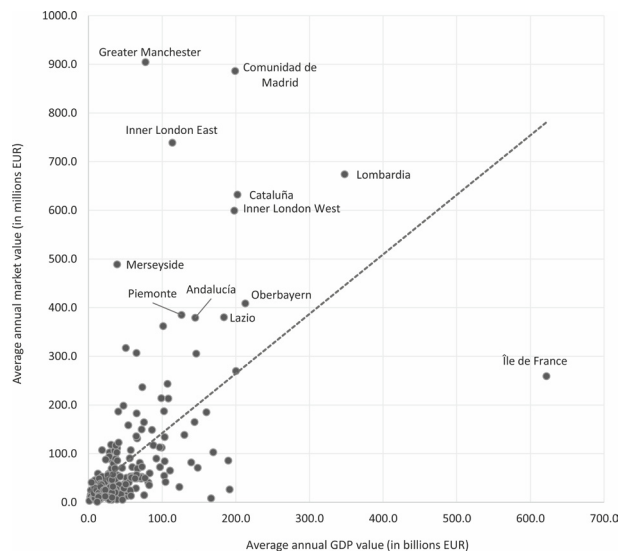


Fig. 7. Regression analysis of average annual market value and average annual GDP value within European Union NUTS 2 regions in 2007–2016

Source: research results (authors' calculations)

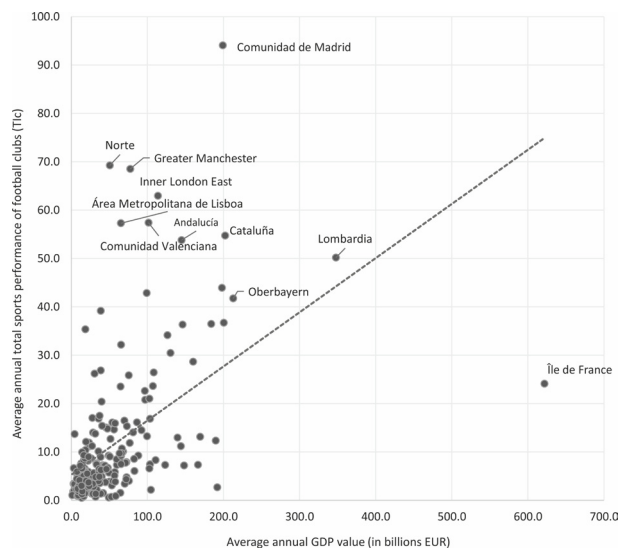


Fig. 8. Regression analysis of average annual total sports performance of football clubs and average annual GDP value within European Union NUTS 2 regions in 2007–2016

Source: research results (authors' calculations)

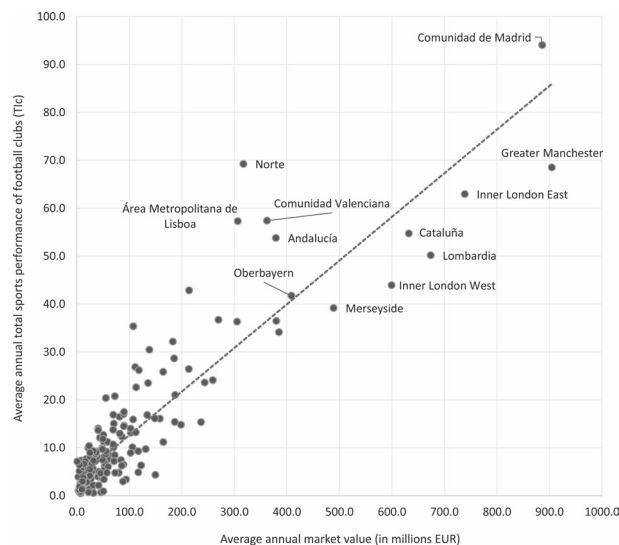


Fig. 9. Regression analysis of average annual total sports performance of football clubs and average annual market value within European Union NUTS 2 regions in 2007–2016

Source: research results (authors' calculations)

4. Conclusion

In recent times, football has become increasingly not only a sports phenomenon but also an economic one. Therefore, the ambition to examine the relationship between the sporting success of football clubs within the European Union member states, their market value and the economic performance of the country and region in which they are located can be considered very topical not only from a scientific but also a social point of view.

When evaluating sports performance, we chose an original methodological approach. We worked with two unique mathematical relationships (the club's *national sports performance index* and its *total sports performance index*), through which we further study the success and relevance of football clubs within EU countries in the domestic league, but also in the context of their results in European competitions. The research required the collection of data on sports performance concerning clubs and their market value. The data was placed in the context of the economic performance of the regions in which the clubs are located. This is really a unique database that captures an entire decade (2007–2016). Subsequently, these variables underwent correlation and regression analysis evaluating their potential mutual linear statistical dependence.

Based on the territorial pattern of sports performance concerning football clubs, we identified a so-called “*football crescent*” stretching along the Spanish, French and Italian coast of the Mediterranean. In absolute terms, however, the Spanish region of *Comunidad de Madrid* dominated in *total sports performance index* in the period in question, significantly ahead of the Portuguese *Norte*, and the English *Greater Manchester* and *Inner London East*. From this point of view, it is not surprising that Western Europe dominates over the eastern part, just as do the clubs of the Top 5 football competitions (Spain, England, Germany, Italy and France).

Of the three variables examined, a strong positive correlation was observed between the market value and the sports performance of the clubs. However, a moderate direct correlation between the region's regional performance (measured by regional GDP value) and the market value of the clubs, as well as their sporting success, was identified as well.

As already mentioned, the most relevant linear statistical relationship was observed at the regional level between the market value of clubs and their sports performance. From this point of view, the Portuguese and Spanish regions (*Área Metropolitana de Lisboa*, *Norte*, *Andalucía* and *Comunidad Valenciana*) are the most successful ones, achieving top football results despite the relatively low market value of the clubs. Conversely, we have identified relatively poorer sports performance at a relatively

high market value for some English regions (*Merseyside* and *Inner London West*).

Apart from other findings, the study has also brought to light the fact that the higher economic performance of a given territorial unit does not always automatically mean a higher market value of clubs (exceptions include e.g. the Netherlands, Sweden, Austria, Ireland or Finland). An important role in this context can be played by the tradition or competition of other sports. It is important to note the fact that clubs with the highest market value are generally found in countries with high economic performance. They are large by both population and territory at the same time, which ultimately means higher competition on the club level and hence better quality, better attendance and a financially more demanding national league. The high values of regional GDP, along with the high market values of clubs, are seen in the regions of *Lombardia*, *Cataluña* and *Inner London West*. The high market value of clubs, with relatively lower regional GDP, is observed in *Greater Manchester*, *Comunidad de Madrid* and *Inner London East*.

Another valuable finding brought by the study is that the sporting success of a football club is not always directly dependent on the economic power of the region in which it is located. Looking more closely at the sports performance of clubs, given the economic level of the regions, the clubs were below-average successful in France, but also in Italy and Germany. Conversely, despite the relatively “lower” gross domestic product (in Europe-wide comparison, not nationally), several English, Spanish, Dutch, Belgian and Portuguese clubs were sportingly more successful. Given the economic productivity of the regions, the club’s sports performance is lower, especially in the *Île de France*, partly in the regions of *Oberbayern* and *Lombardia*. On the other hand, *Cataluña*, *Andalucía*, *Comunidad Valenciana* (Spain), *Área Metropolitana de Lisboa*, *Norte* (Portugal), *Greater Manchester* and *Inner London East* (England) achieved relatively high levels of sporting success at relatively low GDP.

In the future, it seems sensible to explore this issue not only through the assessment of statistical dependence but also in terms of causation, through the use of spatial econometrics tools (e.g. spatial Durbin model).

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