

Xu, Dafeng

**Conference Paper**

## Who Benefits from Globalization of Labor? Evidence from the 'Bosman Ruling'

54th Congress of the European Regional Science Association: "Regional development & globalisation: Best practices", 26-29 August 2014, St. Petersburg, Russia

**Provided in Cooperation with:**

European Regional Science Association (ERSA)

*Suggested Citation:* Xu, Dafeng (2014) : Who Benefits from Globalization of Labor? Evidence from the 'Bosman Ruling', 54th Congress of the European Regional Science Association: "Regional development & globalisation: Best practices", 26-29 August 2014, St. Petersburg, Russia, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/124437>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Who Benefit from Globalization of Labor?

## Evidence from the “Bosman Ruling”<sup>\*</sup>

Dafeng Xu<sup>†</sup>

### Abstract

In 1995, the “Bosman Ruling” was made, resulting that restrictions on foreign players were widely relaxed for football clubs in the European Union (EU), and the football labor market in the EU has been highly globalized since then. To evaluate the impact of the “Bosman Ruling” on inequality among teams (i.e., “competitive balance”), we survey 32 premier leagues in the whole of Europe. Non-EU football clubs are also included to control for other policy and rule changes that may affect the football market across Europe. Two measures of sporting performance are used, including the points per match and the goal difference per match. We find that football clubs in the EU which were stronger sides in the pre-Bosman era received significant benefits from the “Bosman Ruling”. The strong-weak distance in leagues has generally increased, and football leagues in the EU have become more unbalanced due to the “Bosman Ruling”.

**Keywords:** globalization; labor market; football; competitive balance

**JEL Classification:** F66 L83 P25 R23

---

<sup>\*</sup>I have benefited from discussions with Nancy Brooks, Lawrence M. Kahn, Ravi Kanbur, Alfonso Flores-Lagunes and Tony E. Smith.

<sup>†</sup>Cornell Population Center and Department of City and Regional Planning, Cornell University.  
Email: dx42@cornell.edu.

# 1 Introduction

As an old proverb says, “visiting monks give better sermons.” European football clubs also believe this, and have always been seeking for foreign players to boost competitiveness. However, the influx of foreign players may negatively affect the progress of domestic players. Hence, most European football leagues have created strict protectionist policies on foreign players. The main restriction is that each club is only allowed to have up to three foreign players in one match.

It was not until 1995 that this policy started to change. In December 1995, the European Court of Justice made the “Bosman Ruling”, precluding the rule that “in matches in competitions which they (the Union of European Football Associations, or UEFA) organize, football clubs may field only a limited number of professional players who are nationals of other Member States.”<sup>1</sup> Quotas were still imposed, but they were used to restrict the number of non-EU players only. This leads to two outcomes: 1) EU players have been much more mobile because they would not be considered to be foreigners; 2) many non-EU players have come to the EU, as EU clubs could use full quotas to get non-EU players. Both outcomes have made the EU football market highly globalized since then. Indeed, in the final of the 1995 - 1996 UEFA Champions League (the most prestigious tournament for clubs in Europe), when the “Bosman Ruling” had not been made, the Italian club Juventus only fielded three non-Italian players; while in the final in 1997 when Juventus entered again, the number of non-Italian players became five. In the 2005 - 2006 UEFA Champions League Final — ten years after the “Bosman Ruling” was made — two finalists (Barcelona and Arsenal) fielded eight and nine foreign players, respectively.

It has been well studied that labor mobility and globalization drive innovations

---

<sup>1</sup>The full name of this case is: Union royale belge des sociétés de football association ASBL v Jean-Marc Bosman, Royal club liégeois SA v Jean-Marc Bosman and others and Union des associations européennes de football (UEFA) v Jean-Marc Bosman. To check the official details about this case, please visit <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12002E039:EN:NOT>.

(some recent studies include Gorodnichenko et al., 2010 and Kaiser et al., 2011), leading to further economic growth (e.g., Grossman and Helpman, 1994). In most types of markets, it is possible that most or even all firms benefit from globalization. However, from the perspective of sporting performance, in any football league there are only some clubs that are able to get benefit, while other clubs suffer losses<sup>2</sup>: if one club wins one match, there must be another club losing this match. Because there exists an upper bound of the total winning matches in a league, it is impossible to improve sporting performance for all clubs. Hence, the introduction of the “Bosman Ruling” raises a policy question: who benefits from globalization of the football labor market? From the perspective of inequality, will football leagues in Europe become more balanced or unbalanced after this ruling? To study this question, we create a group of “previously strong clubs” in each league based on sporting performance in the pre-Bosman period. Our econometric studies focus on the distance between this group of previously strong clubs and lower-ranking clubs, which is also referred as “competitive balance” (Haan et al., 2008) in the league.

Kesenne (2007) is the first to study the effect of the “Bosman Ruling” on competitive balance. He presents a “two country-four team” model, where revenue functions are quadratic. The model shows that the gap between football clubs in large and small countries is widened, but it does not study competitive balance within each league. In order to conduct empirical analysis, Goossens (2006) and Vrooman (2007) discuss measures of competitive balance and present some preliminary statistical studies. Based on these measures, Dejonghe and Van Opstal (2010) find evidence to support Kesenne’s theory. As for competitive balance in each league, Binder and Findlay (2012) focus on shorter-term observations in some EU countries. They find that effects of the “Bosman Ruling” on competitive balance appear to be minor.

However, there are at least four problems in previous studies. First, these papers

---

<sup>2</sup>This may be incorrect if from other perspectives. For example, attendance rates of all clubs may increase because of some changes of the market.

have not included some crucial covariates that might affect sporting performance. For example, a club’s performance in other tournaments may affect this club’s achievement in the league. Second, and most importantly, these papers only focus on leagues in the EU region; however, observing these leagues only, before and after the ruling was made, would fail to control for unmeasurable or unobservable factors, as there were some other policy and rule changes in the UEFA (including the non-EU region) when the “Bosman Ruling” was made. Third, football clubs are heterogeneous: while some clubs started to obtain many foreign players immediately after the “Bosman Ruling”, some clubs’ preferences of fielding domestic players remained unchanged, possibly due to traditions or financial conditions. These problems make estimations in previous papers biased and imprecise. Finally, competitive balance is usually defined as the distance of sporting performance between top and bottom clubs, but this measure fails to provide information about the distribution of sporting performance in a league (e.g., the distance between top and medium-ranking clubs), and thus the change of competitive balance is still not fully clear.

To solve the first problem, we include two additional covariates of performance in other tournaments. Although we focus on each club’s performance in the domestic league, its results in other domestic and continental tournaments may be correlated with performance in the domestic league.

We employ Difference-in-Difference-in-Differences (DDD) to solve the second problem, as other rule and policy changes (which will be discussed in detailed in Section 2) may also affect sporting performance. The first “difference” is the distance of sporting performance between previously strong and lower-ranking clubs. Then we use a standard Difference-in-Differences framework by introducing clubs in UEFA member states where the “Bosman Ruling” was not effective (e.g., Russia). These clubs constitute the control group as they were not affected by the “Bosman Ruling” at that time, but were still influenced by all other policy and rule changes. By including the

control group, we control for biases caused by omitted factors related to all members of the UEFA.

To solve the third problem, we conduct the regression analysis on the number of foreigners: here, instead of putting the Bosman dummy (i.e., the dummy describing whether the club is affected by the “Bosman Ruling” or not) in the regression, we directly regress the change of sporting performance on the use of foreign players. The Bosman dummy can be used as the instrument variable (IV) for the use of foreign players based on the idea that the “Bosman Ruling” is like a natural experiment conducted solely in the EU part of the UEFA.

Finally, we use three groups of lower-ranking clubs in regressions, including relegated clubs, the lowest-ranking club(s) surviving relegation, and median-ranking clubs. By studying distances between previously strong clubs and different groups of lower-ranking clubs we have a clearer idea about the change of competitive balance caused by the “Bosman Ruling”.

In this paper, sporting performance is measured in two ways: the points<sup>3</sup> per match (point-based) and the goal difference<sup>4</sup> per match (goal-based). Using the point-based measure, we find that the average difference between previously strong and lower-ranking clubs has increased by at least 20% after the “Bosman Ruling”. Furthermore, though all groups of lower-ranking clubs suffer losses from this ruling, median-ranking clubs appears to be the biggest victims. We find qualitatively similar results using the goal-based measure.

Besides the papers mentioned before, our work is related to previous studies of impacts of the “Bosman Ruling” on national football teams. Frick (2009) finds little evidence that the “Bosman Ruling” has impacts on competitive balance of world-wide tournaments. Binder and Findlay (2012) also obtain similar results. Baur and

---

<sup>3</sup>The *points* are used to measure the matching results directly: in football, a team gets 3 points after a win, 1 point after a draw, and no point after a loss.

<sup>4</sup>The goal difference is that the goal a team scores less the goal this team is conceded.

Lehmann (2007) study the relationship between performance of national teams in the World Cup 2006 and the numbers of imported players in their premier leagues. The positive correlation is found, but this result is arguable because only the short-term data set is used. Milanovic (2005) examines competitive balance among clubs, but based on the continental competition instead of domestic leagues.

This paper is also related to classical research of migration, as player mobility is a special case of labor migration, which has been well studied in labor economics (some representative works include Card, 1990; Altonji and Card, 1991; Borjas et al., 1997; Kahn, 2004; Dustmann et. al, 2005). Also since 1980s, a growing number of papers have started to analyze the labor market by studying sports issues, though early discussions of sports labor economics can be dated back to Rottenberg (1956). Some general discussions on the sports labor market include Kahn (2000) and Rosen and Sanderson (2000), and a major specific avenue is to focus on discrimination in the sports labor market (e.g., Johnson and Marple, 1973; Christiano, 1986; Kahn, 1991). Somewhat closer to our work, Ribeiro and Lima (2013) study the effect of player migration on football players' wages in Portugal.

The remainder of the paper is organized as follows. Section 2 gives a brief overview of the historical background of the “Bosman Ruling” and the European football market. This is followed in Section 3, where we describe the data used in this paper. Section 4 introduces our econometric methodologies. Section 5 presents empirical results. Section 6 concludes.

## **2 Historical Background**

### **2.1 The “Bosman Ruling”**

The “Bosman Ruling” was named after the Belgian football player Jean-Marc Bosman. In 1995, his contract with RFC Liège club expired, but his move to the new club,

Dunkerque, was rejected by RFC Liège because a transfer fee was not paid<sup>5</sup>. He thus took this case to the European Court of Justice, and sued the club and the football association for restraint of trade.

Jean-Marc Bosman won and the “Bosman Ruling” was made by the court. The ruling prohibits restrictions on the number of EU players fielded in the match. Prior to 1995, most leagues had restrictions on this: it was only allowed to field three non-national players in any match. In a few cases, some countries had mutual agreement on the labor market with other countries and allowed workers, including football players, to move freely in the region. However, these cases were rare, and such regional markets were also relatively small<sup>6</sup>. After the “Bosman Ruling”, any EU player, even playing in the EU state other than his home country, is considered to be the domestic player, causing huge increase in the number of foreign players after the “Bosman Ruling” came into effect.

Table 1 presents the share of foreign players in the premier leagues in Italy and Spain. The “Bosman Ruling” was made in late 1995, and has been effective since 1996/1997 season. In this table, we observe the significant jump of the share of foreign players from 1995/1996 to 1996/1997 season, showing that the “Bosman Ruling” has the immediate effect on the European football market. We also observe the increase in players from Argentina and Brazil, two main non-EU origins of providing football players. While not reported here, we observe the same trend in other premier football leagues in the Bosman region.

Table 2 reports the number of foreign players in finals of two major continental football tournaments, i.e., the European Champions League (ECL) and the UEFA Cup (UC). Column 1 and 3 report the number of foreign players of two finalist

---

<sup>5</sup>Unlike the transaction system commonly used in the professional sports leagues in North America, *transfer* system is used in the European football market: when a player move before his contract is expired, the new club should pay a *transfer fee* to his original club.

<sup>6</sup>For example, football clubs in Nordic countries (including Denmark, Finland, Iceland, Norway and Sweden) could field any number of Nordic players; similarly, there was no limitation for Russian clubs to field players from the Commonwealth of Independent States (CIS).



Table 1: Foreign Players in Italy and Spain

Season	Italy		Spain	
	(1)	(2)	(3)	(4)
1990/1991	15.2%	5.6%	14.0%	3.9%
<b>1995/1996</b>	16.3%	2.9%	21.0%	5.6%
<b>1996/1997</b>	22.0%	4.0%	35.3%	9.9%
1999/2000	34.1%	8.3%	39.7%	12.8%
2003/2004	34.2%	9.0%	34.5%	15.6%
2013/2014	55.2%	18.0%	39.0%	10.0%

- (1): share of foreign players in Italy Serie A.  
(2): share of Argentinian and Brazilian in Serie A.  
(3): share of foreign players in Spain La Liga.  
(4): share of Argentinian and Brazilian in La Liga.

clubs in finals of ECL and UC in selected seasons. The increase in the number of foreign players is clearly shown in both columns. In particular, the relaxation of the restriction on foreign players causes the influx of players from South America. Column 2 and 4 report the number of Brazilian and Argentinian players of two finalist clubs in two tournaments. The pattern is consistent with that shown in Table 1, indicating that the “Bosman Ruling” has not only led to liberalization of the football labor market for EU players, but also caused globalization of labor, making non-European players move to Europe as well.

Table 2: Foreign Players in Finals of Major Continental Tournaments

Season	Champions League (CL)		UEFA Cup (UC)	
	(1)	(2)	(3)	(4)
1990/1991	5	1	6	1
<b>1995/1996</b>	5	0	4	0
<b>1996/1997</b>	8	0	11	1
1999/2000	11	6	12	3
2003/2004	11	4	12	4
2012/2013	12	2	21	10

- (1): number of foreign players in CL’s final.  
(2): number of Argentinian and Brazilian in CL’s final.  
(3): number of foreign players in UC’s final.  
(4): number of Argentinian and Brazilian in UC’s final.

Note that not all member states of the UEFA was affected by the “Bosman Rul-

ing”. Some European countries are not in the EU or has not joined the EU by the time when this ruling was made, e.g., Russia and Czech Republic. It was not until early 2000s that these countries finally relaxed the restriction of fielding foreign players, by joining the EU (such as in Czech Republic and Poland) or modifying related rules (such as in Russia and Ukraine). Hence it is difficult to observe the trend in these countries in mid-1990s similar with that shown in Table 1.

## 2.2 Other Policy and Rule Changes of Football in 1990s

The “Bosman Ruling” was not the only policy change affecting competitive balance of European football leagues in 1990s. There were at least two other major policy and rule changes that also influenced football in Europe, and both of them were widely considered to be crucial. First, starting from early 1990s, a club could obtain 3 points when winning a match in the league, while the club only got 2 points before early 1990s. This might influence clubs’ playing strategies, and furthermore, sporting performance. Second, European football tournaments for clubs have largely expanded<sup>7</sup> and became much more commercial and lucrative. The increasingly high revenue of these continental tournaments made more clubs richer and capable of purchasing high-skilled players. These changes influenced tactics and financial status for football clubs in Europe, and therefore affected competitive balance.

As discussed in the previous section, the above policy and rule changes may confound the estimates of the effect of the “Bosman Ruling”. However, the decision of the “Bosman Ruling” omitted variables of other policy and rule changes are controlled for by introducing clubs in the region that were not affected by the “Bosman Ruling” as control samples.

---

<sup>7</sup>Take the example of the European Champions League: prior to 1997, only the winner in each domestic league could participate in this tournament; after that, runner-up of the domestic league could also enter. This tournament even further expanded soon afterwards, accepting up to four clubs for some countries.

### 3 Data

The data used in this paper are collected in 32 domestic premier leagues in the UEFA. Among all 106 clubs surveyed in our paper, 49 clubs from England, France, Germany, Italy, Spain, Norway, Scotland and Greece constitute the treatment group, while other 57 clubs form the control group.

The starting season in the data set is mostly 1990/1991 season, with the exception of some Eastern European countries. These countries experienced territorial changes in early 1990s due to political revolutions, and the starting season in any of these countries is usually the first season in which the political situation became stable<sup>8</sup>. The ending season in the data is 03/04 season. Seasons are separated into two periods, i.e., the *pre-Bosman* period (from the starting season to 1995/1996) and the *post-Bosman* period (from 1996/1997 to 2003/2004).

#### 3.1 Measures of Sporting Performance

In this paper we use two measures of sporting performance. Both measures are season-level, but we can easily obtain the period-level values by calculating mean values among seasons in each period. Definitions of two measures are shown below:

1) Point-based measure: points per match, i.e., the total points in a season divided by the number of matches. This is the most commonly used measure, as it directly determines the ranking of the league at the end of the season.

2) Goal-based measure: goal difference per match, i.e., the total goal difference in a season divided by the of number matches. The goal difference in the whole season is total scoring goals minus total conceded goals.

---

<sup>8</sup>For example, the starting season in the premier league of the Czech Republic is 1993/1994 season, as all Czech football clubs played in the Czechoslovakian league prior to the independence of the Czech Republic in Jan 1, 1993.

## 3.2 Previously Strong Clubs

Previously strong clubs are selected based on the point-based measure of sporting performance in the pre-Bosman period, and we use their sporting performance in the post-Bosman period to estimate the effect of the “Bosman Ruling”. The number of the previously strong clubs varies from league to league; it is based on competitiveness of the league, evaluated by the UEFA league ranking. The detailed process of selecting previous strong clubs is presented in the Appendix.

## 3.3 Key Players

Clearly, different foreign players do not contribute equally to the club. Some key players have great contributions to the club, while other non-key players, considered to be back-up ones, contributing less to the club. Therefore, it is necessary to label those foreign key players in a club. This is evaluated by the number of line-up matches, i.e., the number of matches in which the player has the starting position. A player is said to be a key player if he plays as the line-up player in his position more than all other players in the same position in his club.

## 3.4 Performance in Other Tournaments

Though we focus only on competitive balance in domestic leagues, a club’s performance in the domestic league may be affected by its achievement in other tournaments. Indeed, unlike in the North America, European football clubs play not only in a domestic league, but also in a domestic *cup*<sup>9</sup>. Some top clubs in the league will even also participate in one of the continental football tournaments. Though the primary task for each club is to succeed in the domestic league, champion titles in other tournaments also improve the club’s reputation. In particular, a club may intentionally

---

<sup>9</sup>In a few countries, e.g., England and France, local football associations organize two domestic cups. However, in each country there is at least one domestic cup.

underperform in the domestic league in order to perform well in the domestic cup or the continental tournament, when it has a middle position in the league: in this case, the club has very low probability of either getting the champion title or getting relegated in the domestic league, thus it will put great focuses on other tournaments, but underperform in the domestic league<sup>10</sup>. Therefore, the estimates of the effect of the “Bosman Ruling” on sporting performance and competitive balance in the domestic league will be biased if there are clubs that underperform.

In this paper, a club is said to be *underperform* in the domestic league in a season if its points per match in that season is lower than the mean points per match in the period that this season is in. For example, we say a club underperforms in a post-Bosman season with 2 points per match in this season, if its mean points per match in the post-Bosman period is 2.5. To control for the factor of underperformance, we introduce two ordinal covariates: *domcup* and *euro*. *domcup* is the number of domestic cup champions in seasons when the club underperforms in the domestic league, and *euro* is the number of champions of European continental tournaments in seasons when the club underperforms in the domestic league.

## 4 Empirical Strategies

### 4.1 Difference-in-Difference-in-Differences (DDD) Model

To control for other crucial policy and rule changes that are omitted in our empirical analysis, we design a Difference-in-Difference-in-Differences (DDD) model based on the panel nature of our data:

$$\Delta\Pi_{jt}^i = \mathbf{X}_{it}\boldsymbol{\beta}_t + \beta_B\text{Bosman} + \beta_t\text{time} + \beta_{Bt}\text{Bosman} \cdot \text{time} + L_j + \varepsilon_{jt}^i \quad (1)$$

---

<sup>10</sup>One latest example involves Chelsea in 2012. Chelsea won European Champions League, but finished only 6th position in the English Premier League, a much lower position than the average position of Chelsea in the domestic league.

Fixing period  $t$  (pre- or post-Bosman period),  $\Delta\Pi_{jt}^i$  is the difference of sporting performance between the previously strong club  $i$  and a group of lower-ranking clubs (e.g., middle-ranking clubs) in league  $j$ . Fixing the period  $t$ ,  $\mathbf{X}_{it}$  is club  $i$ 's vector of performance in the domestic cup and continental football tournaments that may affect its sporting performance in the domestic league. It contains two variables *domcup* and *euro*, which are defined in previous sections. *Bosman* is the treatment dummy such that  $Bosman = 1$  if the club plays in the league in the region where the “Bosman Ruling” is effective at period  $t$ , and  $Bosman = 0$  otherwise. *time* is the period dummy such that  $time = 1$  if after 1995/1996 season (i.e., the post-Bosman period), and  $time = 0$  otherwise.  $Bosman \cdot time$  is the interaction between the treatment dummy and the period dummy.  $L_j$  is the league dummy.

The first “difference”, presented in the dependent variable, concerns the difference of sporting performance between the strong club  $i$  and lower-ranking clubs. One mainstream way to define this difference is based on the point-based measure of sporting performance, and the difference is between a previously strong club and bottom clubs that relegate at the end of the season (Binder and Findlay, 2012). However, in this paper we also discuss other groups of lower-ranking clubs for a more complete study on competitive balance. For example, one interesting point is to focus on the difference between a strong club and middle-ranking clubs, because middle-ranking clubs are potential challengers of top clubs. Investigating whether middle-ranking clubs suffer heavy losses from the “Bosman Ruling” helps us understand whether a league is controlled by few monopolistic clubs due to this ruling.

The right hand side of the model presents a standard Difference-in-Differences (DD) structure. While the *Bosman* dummy controls for the region and the *time* dummy controls for the period, their interaction  $Bosman \cdot time$  indicates treatment status, and  $\beta_{Bt}$  is the treatment effect. In addition, the inclusion of  $\mathbf{X}_{it}$ , sporting performance in other competitions, and the league fixed effects  $L_j$  help to control for

heterogeneity. The treatment effect of the “Bosman Ruling” is thus identified at the distance-region-period level given the set of controls .

## 4.2 OLS and Instrumental Variable (IV) Regressions

One caveat of the DDD estimation is that it does not provide any detailed information of the number of foreign players. Indeed, even within the region where the “Bosman Ruling” is effective, football clubs are largely heterogeneous for having foreign players. For example, Arsenal (in England) and Internazionale (in Italy) are two most famous top clubs of purchasing a large number of non-native players. However, there are also top clubs that did not start to purchase foreign key players even after the “Bosman Ruling”. There are two main reasons for this: first, some clubs have the tradition of mainly training domestic players (e.g., Juventus in Italy); second, some clubs may not be financially strong enough to buy many foreign players (e.g., Zaragoza in Spain). One way to solve this heterogeneity problem is to directly run an OLS regression of the change of the difference between previously strong and lower ranking clubs on the change of number of foreign key players.

Unlike in the DDD regression where the Bosman variable is a dummy indicating the effectiveness of the “Bosman Ruling”, here we focus on  $\Delta N_i$ , the change of the number of foreign key players in club  $i$  before and after the time the “Bosman Ruling” was made. We want to investigate  $\beta_N$ , i.e., the coefficient of  $\Delta N_i$ .  $\beta_N$  shows the contribution of each additional foreign key players brought by the “Bosman Ruling”.

The basic OLS structure is:

$$\Delta \Pi_{j1}^i - \Delta \Pi_{j0}^i = \mathbf{\Delta X}_i \boldsymbol{\beta} + \beta_N \Delta N_i + L_j + \varepsilon_j^i \quad (2)$$

where the dependent variable  $\Delta \Pi_{j1}^i - \Delta \Pi_{j0}^i$  is the change of the pre- and post-Bosman difference of sporting performance between the previously strong club  $i$  and a

group of lower-ranking clubs.  $\Delta \mathbf{X}_i$  is club  $i$ 's vector of the difference between pre- and post-Bosman performance in other tournaments. Similar with that in the DDD model, this vector contains  $\Delta domcup$  and  $\Delta euro$ , where  $\Delta domcup$  is the difference between pre- and post-treatment value of *domcup*, and  $\Delta euro$  is the difference between pre- and post-treatment value of *euro*.  $L_j$  is the league dummy.

One potential problem of the OLS regression is that using  $\Delta N_i$  as the regressor may raise the endogeneity problem. While the change of the number of foreign key players may affect sporting performance of the club, sporting performance of the club may also affect the influx of foreign players, because a club with an improvement of its league position is likely to attract more foreign players to play for. There might also be other unobservable or unmeasurable factors (e.g., changes of local sports facilities) correlated to both sporting performance and the influx of foreign players. League or club dummies cannot solve this problem. One possible way to proceed to estimate the causal effect is to use the Bosman dummy to instrument for the change of the number of foreign key players. The Bosman dummy exogenously changes the number of foreign players, as the ‘‘Bosman Ruling’’ is like a natural experiment conducted on different European countries. It is convincing to assume the exclusion restriction: the ruling itself does not directly affect sporting performance of the team; it affects sporting performance only because it breaks the ‘‘trade barrier’’ and allows clubs in the Bosman region to purchase and field more foreign players, which are likely to have better football techniques. In other words, the Bosman dummy affects a club’s sporting performance only through the change of foreign key players.

To estimate the causal effect, we conduct the two-stage-least-squares (2SLS) regressions. We run the first-stage regression

$$\Delta N_i = \Delta \mathbf{X}_i \boldsymbol{\beta} + \pi_B^r Bosman + L_j + \eta_j^i \quad (3)$$



thus we obtain the fitted value. By the prediction in the first stage regression, we proceed to the following regression

$$\Delta\Pi_{j1}^i - \Delta\Pi_{j0}^i = \mathbf{\Delta X}_i\boldsymbol{\beta} + \hat{\beta}_N\widehat{\Delta N}_i + L_j + \mu_j^i \quad (4)$$

By above regressions we obtain the IV estimate  $\hat{\beta}_N$ . This coefficient is the contribution of each additional foreign key player purchased after the “Bosman Ruling”.

## 5 Results

### 5.1 DDD Results

Table 3 and 4 present the main DDD results. Column 1 reports the simplest regression in which we only include dummies *time*, *Bosman* and *Bosman · time*. This indicates that the difference of the points per match between previously strong and median-ranking clubs increases by 0.224 point after the “Bosman Ruling”. This increase is quite large (and also statistically significant), as the pre-Bosman difference of the points per match between previously strong and median-ranking clubs is 0.336 in the treatment group, indicating that the strong-weak distance in the post-Bosman period increased by more than 60%. In other words, domestic leagues in the treatment group become more unbalanced due to the “Bosman Ruling”, in the sense that median-ranking clubs become less competitive. While not reported here, the DDD structure and the inclusion of the control group is crucial in the estimation of the treatment effect. If only making comparison between the pre- and post-treatment distance of the points per match between previously strong and median-ranking clubs in the treatment group, the increase of this strong-weak distance is only 0.065, with the standard error 0.214.

We expand the regression in Column 1 by including other covariates and fixed

Table 3: Difference between Previously Strong and Lower-ranking Clubs: DDD

	(1)	(2)	(3)	(4)
<i>Bosman · time</i>	0.224 (0.085)	0.226 (0.086)	0.226 (0.072)	0.235 (0.039)
<i>domcup</i>	—	−0.015 (0.032)	−0.008 (0.031)	−0.119 (0.025)
<i>euro</i>	—	0.011 (0.057)	0.061 (0.053)	−0.063 (0.400)
League fixed effects	No	No	Yes	No
Club fixed effects	No	No	No	Yes
R <sup>2</sup>	0.172	0.173	0.508	0.916
Number of observations	106	106	106	106

Standard errors are in parentheses.

Dependent variables: point-based sporting performance difference between previously strong and median-ranking clubs.

effects in Column 2 to 4. While the achievement in the domestic cup and European continental tournaments may have some impacts on sporting performance in the domestic league, such impacts are fairly minor. The treatment effects estimated in Column 2, 3 and 4 are almost identical to the result in Column 1.

In Table 4, we continue to investigate the difference between previously strong clubs and other groups of lower-ranking clubs. In Column 1 and 2 we focus on the difference between previously strong clubs and relegated clubs. In Column 3 and 4, we turn to the lowest club surviving relegation (the club ranking one place higher than the zone of relegation) at the end of the season. Similar with our findings in Table 3 and 4, we find that the sporting performance difference between previously strong clubs and lower-ranking clubs has become significantly greater after the “Bosman Ruling”. All columns show the same qualitative pattern of competitive balance, and our most conservative estimation (based on the treatment effect on the difference between previously strong and relegated clubs) in Table 3 and 4, the strong-weak distance has increased by at least 20%.

So far we have confirmed that previously strong clubs indeed benefit from the “Bosman Ruling”. We now turn to the question that who are the biggest “victims”

Table 4: Difference between Previously Strong and Lower-ranking Clubs: DDD (2)

	(1)	(2)	(3)	(4)
<i>Bosman · time</i>	0.218 (0.071)	0.229 (0.037)	0.188 (0.071)	0.197 (0.036)
<i>domcup</i>	-0.018 (0.031)	-0.140 (0.023)	-0.011 (0.030)	-0.124 (0.023)
<i>euro</i>	0.063 (0.053)	-0.059 (0.038)	0.062 (0.052)	-0.063 (0.037)
League fixed effects	Yes	No	Yes	No
Club fixed effects	No	Yes	No	Yes
R <sup>2</sup>	0.644	0.945	0.586	0.938
Number of observations	106	106	106	106

Standard errors are in parentheses.

Dependent variables in (1), (2): point-based sporting performance difference between previously strong and relegated clubs.

Dependent variables in (3), (4): point-based sporting performance difference between previously strong and the lowest club surviving relegation.

of the ruling. Somewhat surprisingly, the largest increase is found when the dependent variable in the regression is the distance between previously strong clubs and median-ranking clubs. In other words, median clubs are the main sources that previously strong clubs “steal” the points from. It is hard to interpret this result if we only look at the treatment group. However, we may understand this result by comparing clubs in the control group.

European continental tournaments became rapidly expanded and profitable in mid-1990s. Top clubs receive high revenue; clubs at the middle position are also likely to participate in continental tournaments and get revenue; bottom clubs have low possibility of participating in continental tournaments. In the region where the “Bosman Ruling” is not effective, strong clubs usually strengthen their teams by buying high-skilled players from lower-ranking clubs in the domestic league, but median-ranking clubs are more likely to keep their players with the increase in revenues. In the region where the “Bosman Ruling” is effective, however, strong clubs can purchase foreign players from other leagues. These players may have higher skills than domestic play-

ers in median-ranking clubs, and are likely to be expensive so that only top clubs (but not median-ranking clubs) can afford. Therefore, median-ranking clubs in the treatment group become relatively weaker than previously strong clubs, if compared with median-ranking clubs in the control group. This explains our results in Table 3 that it is the distance between previously strong clubs and median-ranking clubs that increases most.

## 5.2 IV Results

We now proceed to verify the relationship between the number of foreign players and the distance between previously strong clubs and lower-ranking clubs.

Table 5: Difference between Previously Strong and Lower-ranking Clubs: IV

	OLS	OLS	OLS	IV	IV
	(1)	(2)	(3)	(4)	(5)
Change of the number of foreign <b>key</b> players ( $\Delta N$ )	0.113 (0.012)	—	0.104 (0.012)	0.122 (0.019)	—
Change of the number of all foreign players ( $\Delta \tilde{N}$ )	—	0.031 (0.005)	—	—	0.045 (0.007)
$\Delta_{domcup}$	—	—	-0.070 (0.022)	-0.063 (0.023)	-0.119 (0.025)
$\Delta_{euro}$	—	—	-0.051 (0.035)	-0.048 (0.036)	-0.063 (0.040)
R <sup>2</sup>	0.449	0.233	0.506	0.496	0.366
Number of observations	106	106	106	106	106

Standard errors are in parentheses.

Dependent variables: pre- and post-Bosman change of the point-based sporting performance difference between previously strong and median-ranking clubs.

We start with a preliminary OLS regression in Column 1, Table 5. The result shows that each new foreign key player from other countries contribute an increase of 0.113 point per match on average. In Column 3 we add two covariates, and the coefficient of  $\Delta N$  is 0.104, which is only slightly less than that in Column 1. In Column 2 we investigate the impact of all foreigners, including non-key players, in the club. This regressor is denoted as  $\Delta \tilde{N}_i$ . Its coefficient is less than one third of

that shown in Column 1, which is not surprising, as clubs often buy foreign players more than they need to field regularly (e.g., for back-up), and thus  $\Delta N_i$  is usually much smaller than  $\Delta \tilde{N}_i$ .

We turn to IV regressions in Column 4 and 5. In these regressions, the Bosman dummy serves as the instrument for  $\Delta N_i$  and  $\Delta \tilde{N}_i$ . Both the coefficient of  $\Delta N$  and  $\Delta \tilde{N}$  are greater than those reported in OLS regressions (and are statistically significant). Note that in the region where the “Bosman Ruling” becomes effective in 1996, the average change of the number of foreign key players in previously strong clubs is 2.16, and the average change of the number of all foreign players is 7.02. This indicates that the “aggregated treatment effect” (of new foreign players) estimated in this table is consistent with the DDD results shown in Table 3.

However, we should point out that key players have much higher contribution to the club (as well as competitive balance) than non-key players, though we can obtain similar “aggregated treatment effect” calculated by the coefficient in Column 4 and 5. This can be easily checked by using  $(\Delta \tilde{N}_i - \Delta N_i)$  as the regressor in IV regressions. While not reported here, we observe minor impacts of these non-key players, and corresponding coefficients are statistically insignificant.

In Table 6 we turn to investigate the difference between previously strong clubs and other groups of lower-ranking clubs, including relegated clubs and the lowest club surviving relegation.

In Table 6, we first focus on the difference between previously strong and relegated clubs in Column 1 and 2. Similar with our observations in Table 5, OLS provides the downward estimate of the contribution of each foreign key player than the IV estimate. In Column 3 and 4 we focus on the lowest club surviving relegation. The qualitative pattern in Column 1 and 2 holds, though the corresponding coefficient becomes smaller, as shown in Column 4. While not reported here, results are similar with those in Table 5 if we use  $\Delta \tilde{N}_i$  (i.e., considering all foreign players) as the

Table 6: Difference between Previously Strong and Lower-ranking Clubs: IV (2)

	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Change of the number of <b>key</b> foreign players ( $\Delta N$ )	0.087 (0.018)	0.119 (0.017)	0.087 (0.012)	0.102 (0.105)
$\Delta_{domcup}$	-0.103 (0.023)	-0.085 (0.023)	-0.102 (0.023)	-0.077 (0.021)
$\Delta_{euro}$	-0.056 (0.032)	-0.044 (0.036)	-0.056 (0.032)	-0.050 (0.033)
$R^2$	0.728	0.483	0.694	0.495
Number of observations	106	106	106	106

Standard errors are in parentheses.

Dependent variables in (1), (2): pre- and post-Bosman change of the point-based sporting performance difference between previously strong and relegated clubs.

Dependent variables in (3), (4): pre- and post-Bosman change of the point-based sporting performance difference between previously strong clubs and the lowest club surviving relegation.

regressor. In addition, we have the same findings as in the DDD analysis: compared with top clubs, median-ranking clubs are weakened most after the “Bosman Ruling”, though all groups of lower-ranking clubs suffer losses.

One issue of the regressors used in this section is that both  $\Delta N$  and  $\Delta \tilde{N}$  only contain the information of the change of foreigners of previously strong clubs, but not the information of foreign players in lower-ranking clubs. As a result, coefficients of both  $\Delta N$  and  $\Delta \tilde{N}$  reported in above tables are underestimated, considering the fact that lower-ranking clubs may also buy foreign players after the ruling. In fact, it is possible that even more foreign players play key roles in some lower-ranking clubs than in top clubs. However, the average quality of foreign players in lower-ranking clubs is clearly lower than that in top clubs. Therefore, it is unfair to directly compare the number of foreign key players in strong clubs with that in weak clubs. Because it is difficult to measure players’ football skills, this heterogeneity problem cannot be easily solved. Therefore, all regressions reported in this section are still based only on the pre- and post-treatment change of foreign players in previously strong clubs.

### 5.3 Additional Tests

The empirical analysis concludes by several additional tests on both DDD and IV regressions to check the robustness of our results in previous studies. In this part, we turn to use the goal-based measure of sporting performance to describe the difference between strong and weak clubs and check the effect of the “Bosman Ruling” on competitive balance in European football leagues. The goal difference per match can reflect sporting performance of football clubs: good attackers can raise the number of scoring goals, and good defenders can reduce the number of conceded goals. Based on this measure, the difference between previously strong clubs and lower-ranking clubs is defined as the difference of the goal difference per match between previously strong clubs and lower-ranking clubs.

We begin by repeating DDD regressions in Table 6, replacing the point-based measure of sporting performance by the goal-based measure of sporting performance.

Table 7: Distance between Previously Strong Clubs and Lower-ranking Clubs: DDD

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Bosman · time</i>	0.394 (0.072)	0.409 (0.114)	0.408 (0.116)	0.425 (0.070)	0.396 (0.114)	0.412 (0.064)
<i>domcup</i>	-0.004 (0.049)	-0.172 (0.025)	-0.030 (0.050)	-0.225 (0.044)	-0.021 (0.049)	-0.206 (0.040)
<i>euro</i>	0.094 (0.085)	-0.090 (0.400)	0.088 (0.086)	-0.099 (0.072)	0.090 (0.085)	-0.097 (0.065)
League fixed effects	Yes	No	Yes	No	Yes	No
Club fixed effects	No	Yes	No	Yes	No	Yes
R <sup>2</sup>	0.615	0.922	0.785	0.955	0.715	0.948
Number of observations	106	106	106	106	106	106

Standard errors are in parentheses.

Dependent variables in (1), (2): pre- and post-Bosman change of the point-based sporting performance difference between previously strong and relegated clubs.

Dependent variables in (3), (4): pre- and post-Bosman change of the point-based sporting performance difference between previously strong clubs and the lowest club surviving relegation.

We focus on the difference between previously strong and median-ranking clubs in Column 1 and 2, using league and club dummies, respectively. Again, we observe

the significant treatment effect in both regressions. The coefficients show that the goal difference between a strong club and a median-ranking club has increased by around 0.4 goal due to the “Bosman Ruling”. This is fairly high by the football standard: the treatment effect, showing the quantity of the increase in the difference of the goal difference per match, almost exceeds the difference of the goal difference per match between strong and median-ranking clubs prior to the “Bosman Ruling”. This indicates that the distance between previously strong clubs and median-ranking clubs has been doubled due to the ruling based on the goal-based measure of sporting performance. We turn to the difference between previously strong clubs and other two groups of lower-ranking clubs in Column 3 to 6, respectively. The corresponding treatment effects are slightly greater than those reported in Column 1 and 2. This, again, shows that median-ranking clubs are weakened most, because they are relatively stronger than other groups of lower-ranking clubs. The conclusion is consistent with our previous findings using the point-based measure of sporting performance.

To conclude additional tests, we proceed to test OLS and IV regressions using the goal-based measure of sporting performance in Table 8.

We start our analysis in Column 1 and 2 by focusing on the difference between previously strong and median-ranking clubs. Similar with previous regressions using the point-based measure of sporting performance, OLS provides the downward estimate of the contribution by foreign key players. Column 2 indicates that each new foreign key player in strong clubs contribute to 0.2 additional goal difference in a match with a median-ranking club on average. This result is consistent with our findings using the point-based measure of sporting performance, as the mean value of the change of the number of foreign key players is 2.16. We repeat the exercise in remaining columns in Table 8, with focuses on relegated clubs and the lowest club surviving relegation in Column 3 and 4, and Column 5 and 6, respectively. Results from Column 3 to 6, again, follow the qualitative pattern observed before: other



Table 8: Difference between Previously Strong and Lower-ranking Clubs: IV

	OLS	IV	OLS	IV	OLS	IV
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
Change of the number of foreign <b>key</b> players ( $\Delta N$ )	0.133 (0.033)	0.212 (0.033)	0.134 (0.033)	0.220 (0.036)	0.134 (0.033)	0.214 (0.031)
$\Delta_{domcup}$	-0.124 (0.042)	-0.075 (0.044)	-0.131 (0.043)	-0.123 (0.046)	-0.130 (0.043)	-0.107 (0.040)
$\Delta_{euro}$	-0.097 (0.058)	-0.063 (0.066)	-0.097 (0.060)	-0.071 (0.072)	-0.097 (0.059)	-0.069 (0.062)
R <sup>2</sup>	0.702	0.410	0.727	0.382	0.685	0.457
Number of observations	106	106	106	106	106	106

Standard errors are in parentheses.

Dependent variables in (1), (2): pre- and post-Bosman change of the point-based sporting performance difference between previously strong and median-ranking clubs.

Dependent variables in (3), (4): pre- and post-Bosman change of the point-based sporting performance difference between previously strong and relegated clubs.

Dependent variables in (5), (6): pre- and post-Bosman change of the point-based sporting performance difference between previously strong clubs and the lowest club surviving relegation.

lower-ranking clubs suffer losses from the “Bosman Ruling” as well. However, among “victims”, median-ranking clubs are weakened most. But basically, all lower-ranking clubs become weaker, and in the region where the “Bosman Ruling” came into effect in 1996, domestic leagues become generally more unbalanced.

## 6 Conclusion

This paper studies the impact of globalization of the football labor market, caused by the “Bosman Ruling”, on competitive balance in European domestic football leagues. The “Bosman Ruling” liberalized the football market in Europe and treated all players from the European Union (EU) as domestic players, affecting sporting performance of both top and lower-ranking clubs. However, the estimation of the effect of the “Bosman Ruling” on competitive balance in domestic leagues may be biased because there were other policy and rule changes that could also affect sporting performance of football clubs, and furthermore affect competitive balance. Therefore, it raises an

econometric problem if only observing the difference of competitive balance between pre- and post-Bosman period in the area where the “Bosman Ruling” came into effect.

To solve this problem, we employ Difference-in-Difference-in-Differences (DDD) and Instrumental Variable (IV) regressions to control for omitted variables confounding the analysis of the “Bosman Ruling” effect. Because the “Bosman Ruling” was made by the European Court of Justice, the highest court in the EU, the trade barrier was not broken for all European countries. This created a Bosman region and a non-Bosman region, and furthermore, formed a natural experiment whereby clubs receiving the treatment of the “Bosman Ruling” can be compared against clubs not receiving this treatment. Based on this idea, we first employ DDD by comparing the pre- and post-Bosman change of the distance between previously strong clubs and lower-ranking clubs among domestic leagues in the Bosman and non-Bosman region. We find that the gap between previously strong clubs and any group of lower-ranking clubs has increased by at least 20% after the “Bosman Ruling” was made. Subsequently, we examine the contribution of each additional foreign key player for previously strong clubs. To do this, we regress the pre- and post-Bosman difference of the distance between previously strong clubs and lower-ranking clubs on the change of the number of foreign key players, while the treatment variable (i.e., the dummy describing whether a club is in the Bosman-region or not) serves as its instrumental variable. Again, we find that the distance between previously strong clubs and lower-ranking clubs has significantly increased for each newly-arrived foreign individual in strong sides. In both parts we observe that the strong-weak gap in leagues has greatly increased. Furthermore, we find that the distance between previously strong clubs and median-ranking clubs has increased most. This is somewhat surprising: bottom clubs in the league are not the only victims of the “Bosman Ruling”, and are even not the biggest victims. In one word, previously strong clubs became stronger, and European domestic football leagues has become increasingly unbalanced due to the

“Bosman Ruling”.

The result in this paper indicates that Coase theorem does not hold in this football case. This is very different from the outcome observed in the North American sports markets (e.g., Major League Baseball), where the change of players’ transfer policy, namely “free agency” (Fishman, 2003), has no effect on player allocation, and thus should not affect competitive balance of the league. The essential distinction between two sports markets is that the North American sports market is considered to be a domestic and free labor market, while the restrictions on foreign players quotas in Europe created high transaction costs in the European football market prior to 1995. Therefore, it is not surprising to see that competitive balance in European football leagues has greatly decreased after the “Bosman Ruling”.

## **Appendix: the Selection of the “Previously Strong Clubs”**

The selection of the previously strong clubs takes the following steps:

1) Determine the number of the previously strong clubs for each league, and denote this number as  $n_i$  for the  $i$ -th league. This number is based on sporting performance of each league in continental tournaments.

2) In the  $i$ -th league, rank football clubs by the mean points per match in the pre-Bosman period (i.e., the mean points per match from 1990/1991 season to 95/96 season).

3) Select the first  $n_i$  football clubs which remained in the premier league for at least five seasons in the pre-Bosman period and seven seasons in the post-Bosman period.

4) In the case that only  $\tilde{n}_i$  (where  $\tilde{n}_i < n_i$ ) football clubs are selected, we relax the requirement in the following way:

4.1) Rank those clubs which remained in the premier league for at least four seasons the pre-Bosman period and seven seasons in the post-Bosman period by the mean points per match in the pre-Bosman period, and select the first  $n_i - \tilde{n}_i$  clubs, such that  $n_i$  clubs are selected in total;

4.2) If there are still less than  $n_i$  clubs selected, rank the clubs remaining in the premier league for at least four seasons the pre-Bosman period and six seasons in the post-Bosman period by the mean points per match in the pre-Bosman period, and select the first  $n_i - \tilde{n}_i$  clubs, such that  $n_i$  clubs are selected in total;

4.3) If there are still less than  $n_i$  clubs selected, we repeat the above procedure to relax the requirement for the number of seasons the club remain in the premier league in the pre- and post-Bosman period season by season, until there are  $n_i$  clubs selected.

## References

- [1] Altonji, Joseph G., and David Card. 1991. "The Effects of Immigration on the Labor Market Outcomes of Less-skilled Natives." in John Abowd and Richard Freeman, eds., *Immigration, Trade, and the Labor Market*, University of Chicago Press, 1991, 201 - 234.
- [2] Baur, Dirk G., and Sibylle Lehmann. 2007. "Does the Mobility of Football Players Influence the Success of the National Team?" *IHS Discussion Paper*, No. 217.
- [3] Binder, John J., and Murray Findlay. 2012. "The Effects of the Bosman Ruling on National and Club Teams in Europe." *Journal of Sports Economics*, 13(2), 107 - 129.
- [4] Borjas, George, Richard Freeman, and Lawrence Katz. 1997. "How Much Do Immigration and Trade Affect Labor Market Outcomes?" *Brookings Papers on*

*Economic Activity*, 28(1), 1 - 90.

- [5] Card, David. 1990. "The Impact of the Mariel Boatlift on the Miami Labor Market." *Industrial and Labor Relations Review*, 43(2), 245 - 257.
- [6] Christiano, Kevin J. 1986. "Salary Discrimination in Major League Baseball: The Effect of Race." *Sociology of Sport Journal*, 3(2), 144 - 153.
- [7] Coase, Ronald H. 1960. "The Problem of Social Cost." *Journal of Law and Economics*, 3(1), 1 - 44.
- [8] Dejonghe, Trudo, and Vim Van Opstal. 2010. "Competitive Balance between National Leagues in European Football after the Bosman Case." *Rivista di Diritto ed Economia dello Sport*, 6(2), 41 - 61.
- [9] Dustmann, Christian, Francesca Fabbri and Ian Preston. 2010. "The Impact of Immigration on the British Labour Market." *Economic Journal*, 507(115), F324 - F341.
- [10] Fishman, Peter. 2003. "Competitive Balance and Free Agency in Major League Baseball." *American Economist*, 47(2), 86 - 91.
- [11] Frick, Bernd. 2009. "Globalization and Factor Mobility: The Impact of the "Bosman-Ruling" on Player Migration in Professional Soccer." *Journal of Sports Economics*, 10(1), 88 - 106.
- [12] Goossens, Kelly. 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.
- [13] Gorodnichenko, Yuriy, Jan Svejnar, and Katherine Terrell. 2010. "Globalization and Innovation in Emerging Markets." *American Economic Journal: Macroeconomics*, 2(2), 194 - 226.

- [14] Grossman, Gene M., and Elhanan Helpman. 1994. "Endogenous Innovation in the Theory of Growth." *Journal of Economic Perspectives*, 8(1), 23 - 44.
- [15] Haan, Marco, Ruud H. Koning, and Arjen Van Witteloostuijn. 2008. "Competitive Balance in National European Soccer Competitions." in Jim Albert and Ruud. H. Koning, eds., *Statistical Thinking in Sports*, Chapman & Hall/CRC, 63 - 75.
- [16] Johnson, Norris R., and David P. Marple. 1973. "Racial Discrimination in Professional Basketball: An Empirical Test." *Industrial and Labor Relations Review*, 6(4), 6 - 18.
- [17] Kahn, Lawrence M. 1991. "Discrimination in Professional Sports: A Survey of the Literature." *Industrial and Labor Relations Review*, 44(3), 395 - 418.
- [18] —————. 2000. "The Sports Business as a Labor Market Laboratory." *Journal of Economic Perspectives*, 14(3), 75 - 94.
- [19] —————. 2004. "Immigration, Skills and the Labor Market: International Evidence." *Journal of Population Economics*, 17(3), 501 - 534.
- [20] Kaiser, Ulrich, Hans C. Kongsted, and Thomas Rønde. 2011. "Labor Mobility, Social Network Effects, and Innovative Activity." *IZA Discussion Paper*, No. 5654.
- [21] Kesenne, Stefan. 2007. "The Peculiar International Economics of Professional Football in Europe." *Scottish Journal of Political Economy*, 54, 388 - 399.
- [22] Kleven, Henrik J., Camille Landais and Emmanuel Saez. 2013. "Taxation and International Migration of Superstars: Evidence from the European Football Market." *American Economic Review*, 103(5), 1892 - 1924.
- [23] Milanovic, Branko. 2005. "Globalization and Goals: Does Soccer Show the Way?" *Review of International Political Economy*, 12(5), 829 - 850.

- [24] Ribeiro, Antonio S., and Francisco Lima. 2013. "Labour Mobility Effect on Wages: the Professional Football Players' Case." presented at the *DRUID Academy*.
- [25] Rosen, Sherwin and Allen Sanderson. 2001. "Labour Markets in Professional Sports." *Economic Journal*, 469(111), F47 - F68.
- [26] Rottenberg, Simon. 1956. "The Baseball Players' Labor Market." *Journal of Political Economy*, 64(3), 242 - 258.
- [27] Vrooman, John. 2007. "Theory Of The Beautiful Game: The Unification Of European Football." *Scottish Journal of Political Economy*, 54, 314 - 354.