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The Effects of the Bosman Ruling on National and Club Teams in Europe

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Abstract

The Bosman ruling and its aftermath allowed soccer players to move more freely between clubs in Europe. This study examines the performance of national and club teams in Europe before and after Bosman. Some national teams improved after the ruling while others became weaker, but the overall effects are small. At the club level, there is little evidence that the competitive balance of the domestic leagues in Europe was seriously harmed, although in the Champions League the top clubs appear to have become noticeably stronger.

Keywords

soccer, bosman ruling, competitive balance

"It is pointless having the best league in the world if our national team is going to suffer in the long run." Steven Gerrard, captain of the Liverpool Football Club and sometime captain of the English national team.

"Should we let the rich become richer and say nothing?" Joseph Blatter, FIFA president.

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Introduction

On December 15, 1995, the Bosman ruling changed the face of soccer within the European Union (EU). It eliminated transfer fees for players out of contract with their teams who wished to change clubs within and between EU countries. It also made quotas on the number of foreigners playing for a club illegal. The governing bodies in various European nations responded by immediately ending quotas on foreign players from EU countries for club matches played within their domestic leagues. Two months later, on February 19, 1996, UEFA struck down restrictions on foreign players (the so-called 3 + 2 rule) in all its club competitions, such as the Champions League and the UEFA Cup.[1]

While some data sources count foreigners in the starting lineup versus those in each squad, there is no doubt that the influx of foreign players into many countries has been significant. In 2008, 63% of players registered in the top division in England were not English. This figure was 36% in Italy, 41% in Spain, and 51% in Germany. Non-English players started only 28.9% of the league matches during the 1994/1995 season, but this figure rose to 45.8% during the 1998/1999 season and 57.6% in 2003/2004.[2,3]

Although academic research on the ruling initially focused on the market for players, recent work investigates the impact on national and club teams.[4] Regarding national teams, Maguire and Pearton (2000) conjecture that an influx of top foreign players to a given country will hurt its national team because it limits the development of domestic players.[5] Symmetrically, this may improve the national teams of countries exporting players to the top European domestic leagues because their skills will improve by playing against better competition.[6]

Nonacademic observers largely agree with Maguire and Pearton (2000) on the impact of Bosman on national teams. For example, Gerry Sutcliffe, Minister for Sport for Britain argues "we have the best league in the world and it's great that we have got the talent. But obviously we need to see how that ... affects the national team."[7] Similarly, England's Football Association (FA), in a report on the national team, concludes that "it is no longer possible to consider the success of the senior men's national team without acknowledging that the number of eligible players for it is declining" due to the number of foreign players in England.[8] FIFA's Blatter has called for a limit of five foreigners playing for a European club during any match. According to Blatter, having more foreigners "is not good for the development of football, for the education of young players."[9]

Although the discussion to date focuses largely on the negative effects of Bosman on the national teams of the major footballing countries, the ruling may also have had positive effects. For example, an influx of top players into a country could increase the quality of the domestic league and the domestic players, improving the country's national team.[10] Furthermore, a country whose best players move to stronger leagues may see an increase or a decrease in the quality of its national team. The team would deteriorate

if the players are dispersed around Europe and they no longer "understand" each other. This would be especially true if before Bosman the team was block built, that is, its core players came from one or two clubs in the domestic league. Or if many of the country's best players move to clubs in the English Premier League, the grueling schedule may leave them exhausted or unfit for international matches.

These effects could occur immediately and/or over the longer term. For example, if the equilibrium placement of players was reached quickly and the quality of soccer improved immediately in a domestic league, an improvement in the national team would occur immediately. On the other hand, if an influx of foreign players limited the opportunities for young domestic players, the effect on the national team would not have been fully realized for some time. The current national players were fully developed and the team would weaken only as they were replaced by lower caliber players.

Interestingly, while some blame the Bosman ruling for the failures of the English national team, many hail the current English players as a "golden generation" of great ability.[11] David Beckham, Steven Gerrard, Frank Lampard, Michael Owen, John Terry, and Wayne Rooney are among the players England has produced post-Bosman. Similarly, Germany has produced Michael Ballack, Miroslav Klose, Thomas Mueller, and Lukas Podolski, to name just a few, since the Bosman ruling, while Spain recently won both the European championship and the World Cup.

Frick (2009) empirically investigates the effect of Bosman on national teams, using data from matches at the European championships and the World Cup from 1976 to 2006. He finds no evidence that team performance, that is, whether the national team made the semifinals/final match of the tournament, is correlated with how many of the country's players were roistered by club teams abroad. Similarly, he cannot reject the null hypothesis that individual match results (measured by goal difference) were on average unaffected by Bosman. However, these tests may not be very powerful because the dependent variable, based on individual match or tournament outcomes, is quite noisy. Secondly, if some national teams improved and others declined due to Bosman, the average effect may be indistinguishable from zero even though the ruling had important effects on individual countries. Baur and Lehmann (2008) regress the FIFA ranking for national teams in the 2006 World Cup against the number of top players imported into/exported by each participating country. This is a less noisy measure of national team quality. They find that national team strength is positively related to both the number of top players imported into and exported from the country. This indicates that on average an inflow/outflow of top players to/from a given country improved the national team. As noted above, however, there may still be considerable variability around these averages which is hidden within the aggregate effect.

Regarding club teams, Kesenne (2007) theoretically examines the effects of Bosman within and across countries. He uses a two country (where the markets are of different sizes) model with two clubs per country and assumes that each club is a win maximizer subject to its constraints. His model predicts that post-Bosman more

talent will flow to the countries with the bigger markets for club soccer, increasing the disparity between club teams across countries. The competitive balance within countries, defined as the variability in strength across clubs within a country, is not affected, however.

Outside of academia, it is generally claimed that the stratification between clubs within each EU country as well as across clubs in Europe has increased since the Bosman ruling. FIFA president Joseph Blatter believes that "[t]he gap between football's rich and poor is widening, as is the imbalance between associations and leagues."[12] He likens it to a battle between the "haves," who compete with nuclear warheads, and the "have-nots," who rely on spears.[13] Regarding the English Premier League, Kevin Keegan states "[t]his league is in danger of becoming one of the most boring ... in the world. The top four teams this year will be the same next year."[14]

In terms of competitive balance within the domestic leagues, Vrooman (2007) empirically investigates the variability of club performance over time in the five largest European leagues (measured by attendance). He finds little effect of the Bosman ruling on these leagues. Haan, Koning, and van Witteloostuijn (2008) examine various measures of competitive balance at the club level for the six biggest European leagues plus Belgium. They find that the variability of team strength across teams (within season) increased in England and decreased in Italy after the Bosman ruling, while dominance by the top four club teams increased in England and Italy. In contrast to Vrooman (2007), Haan et al. (2008) report a significant decrease in the variability of team performance over time in England and the Netherlands using one of two different statistics. Overall, with the exception of England, they find little evidence of a decrease in competitive balance at the club level within European countries.[15] However, these results are difficult to interpret because the number of teams in each league changes over time, affecting the various measures of competitive balance.

In terms of the competitiveness of club teams across countries, Kesenne (2007) examines the percentage of semifinalists in the Champions League from the four strongest domestic leagues in Europe, England, Germany, Spain, and Italy, over time. He finds that from 1994 to 1998 55% of the semifinalists were from the Big Four while from 1999 to 2003 the figure increased to 95%. On the surface, these statistics support his hypothesis that there will be an influx of strong players from around Europe into the major domestic leagues after Bosman. However, this test does not hold everything else equal. First, the inflow of foreign players to many European leagues began in 1995, which is during Kesenne's control period. Second, starting with the 1997/1998 season the Champions League changed its format to include second place finishers from the top eight leagues. All else equal, the number of semifinalists from the four strongest leagues would have increased due to this.

This article statistically examines the effects of the Bosman ruling on (a) the strength of national teams in Europe and (b) competitive balance within domestic leagues in the EU and also in the Champions League. National team strength is measured by the country's ELO rating, which is a more accurate ranking during the sample

period than the one constructed by FIFA. Individual countries in Europe are examined as well as broad groups of countries on average. While various national teams are affected by Bosman, the effects differ across countries and appear to be much less negative than has been hypothesized by many observers. For example, the national teams in the countries with the greatest influx of players were unaffected by Bosman.

At the club level, the ruling did not noticeably affect competitive balance within the various domestic leagues. Across countries, evidence from the Champions League indicates that the top European clubs have become relatively stronger due to Bosman. But, this also greatly increased the level of play and interest in the Champions League and some of the domestic leagues, which has been beneficial for the growth of the game worldwide. Overall, the negative effects of the Bosman ruling appear to be fairly minor.

National Team Regressions

Methodology

To test the hypothesis that Bosman affected the strength of national teams in Europe, we examine the major Euopean soccer powers which were EU members at the time of the Bosman ruling.[16] The sample consists of countries which were (a) EU members at the time of the Bosman ruling and (b) among the 20 European countries with the highest average match attendance in their domestic soccer league during the 2006 to 2007 season. In order from highest to lowest average attendance, these countries are: Germany, England, Spain, France, Italy, the Netherlands, Scotland, Portugal, Belgium, Sweden, Norway, Denmark, Austria, and Greece.[17]

We estimate the following equation for these fourteen countries as well as for various groups of countries:

$$\begin{aligned} \mathrm{ELO_t} = {} & \alpha_0 + \alpha_1 \mathrm{ELO}_{t-1} + \alpha_2 \mathrm{TREND}_t + \alpha_3 \mathrm{THIRD}_t + \alpha_4 \mathrm{D1991}_t \\ & + \alpha_5 \mathrm{D1}_t + \alpha_6 \mathrm{D2}_t + \varepsilon_t \end{aligned} \tag{1}$$

Equation (1) is an intervention analysis model of the type discussed by Box and Tiao (1975). It models the stochastic part of the series as a first order autoregressive process and the deterministic part of the series with zero–one and other variables. The variable ELO_t is the ELO (sometimes written as Elo) rating for the country (or the average ELO rating for a group of countries) at time t. The ELO rating, discussed further below, is a measure of national team strength. ELO ratings 6 months apart are examined in this study. The first two variables control for the time series behavior of the rating by allowing for an autoregressive process and a linear time trend in it. These variables will capture the influence of other factors which may affect the quality of the national team(s) but are not directly measurable. For example, national team strength might be a function of some variable X which is not observable but

whose values persist over time. This will cause the ELO rating to be positively autocorrelated.[18] Similarly, a steady rise over time in national interest in sports or the technical abilities of the country's players would gradually improve the quality of the domestic league and the national team. This type of effect is captured by the coefficient on the time trend variable $TREND_t$. This eliminates spurious regression results due to the time series behavior of the ELO ratings, such as those discussed by Granger (1969).

During the estimation period (1984 to 2007), there were two other major changes in world soccer which likely affected the relative strengths, and therefore the ELO ratings, of European national teams. First, countries in what might be described as soccer's "Third World"—that is, outside of Europe and South America—improved dramatically, partly because they adopted the same tactics as the European and South American teams and partly because the training of their players improved. The variable $THIRD_t$ is the average ELO rating for 10 randomly selected countries outside of Europe and South America, whose ELO rating put them among the top 50 in the world at some time during the sample period. If third world soccer improved dramatically during this period, as appears to be the case, and the ELO ratings of those countries increased at the expense of the European countries, the estimate of α_3 will be negative in at least some of the regressions.

Second, political changes in the Soviet Union around 1991 and the resulting freedom of the former East Bloc countries had various effects on soccer. On the one hand, this was equivalent to a mini-Bosman ruling for these countries, with their players allowed to move abroad and foreign players allowed to play for teams in the countries' domestic leagues (within the bounds of the prevailing limits on foreigners per team effective at the time). Second, the economic changes which occurred in the former East Bloc countries coupled with changes in state sponsorship of sports also changed the level of support for the club and national teams. These factors would have affected the relative strength of the Eastern European countries' national teams as well as those of the other European countries. For example, if Eastern European national teams improved after 1991, their ELO ratings would increase while the ratings of other Europeans would in some cases decrease. The zero–one variable $D1991_t$, which equals one beginning March 1991 and zero before that point, is included in Equation (1) to model these changes.[19]

The last two independent variables directly examine the effects of the Bosman ruling on the national teams. We allow Bosman to have an *immediate* effect as well as a *longer term* effect on the teams in question. $D1_t$ equals zero before March 1996 and one afterward and allows for a step change in the ELO rating after the Bosman decision. For example, if an influx of foreign players immediately improved the quality of a country's national team, the ELO rating would increase by α_5.

Separately, there may have been longer term effects of the Bosman ruling. If foreign players inhibited the growth of domestic talent in the longer term, the full effect of this would probably not be felt for years as national team players were replaced gradually from the smaller pool of talent. For the same reason,

this effect may not begin immediately after Bosman. $D2_t$ equals zero before March 1998 (2 years after Bosman) and .05 in March 1998.[20] It increases by .05 every 6 months until it reaches a value of one in September 2007. This variable allows for a gradual change in the ELO rating, starting 2 years after Bosman and continuing for 10 years. That is, $D2_t$ has 20 step changes from September 1997 to September 2007 with the longer term effect of Bosman on the ELO rating, equal to α_6, fully realized starting in September 2007.

The ELO ratings at the beginning of March and September for each year in the sample are collected from the ELO website, as are the ratings for the 10 randomly chosen countries outside Europe and South America.[21,22] Some discussion of the ELO data is in order. This rating system was developed by Bob Runyan in 1997 by adapting the method used by the international chess federation (FIDE) to rate players, which was created by Dr Arpad Elo.[23] The ELO soccer ratings have been calculated back to 1872 when the first international match, between England and Scotland, took place. After every match, a country's rating is revised through an exchange of points between it and the opposing country. The number of points exchanged depends on the relative prematch ratings of the two countries and the importance of the match, with major tournaments receiving a higher weight than friendly matches. The winning country cannot lose ELO points, but if it is rated much higher than its opponent it may gain only a few (or zero) points despite winning the match. Thus, ELO ratings are a measure of national team strength based on longer term match results, as opposed to the opinions of a survey group (as in some college sport ratings in the United States). They are similar to the FIFA rankings used by Baur and Lehmann (2008), which are discussed further below, and suggested for use by Frick (2009, ftnt. 9). On April 24, 2008, Brazil's national team ranked first in the world with an ELO rating of 2062.[24] Mexico was ranked number 10 (ELO rating of 1874), Paraguay was ranked number 20 (1778), Ireland was ranked number 30 (1736), Norway was ranked number 40 (1705), and Peru was ranked number 50 (1614). At the other end of the spectrum, Palau in the Northern Pacific ocean was ranked number 229 with a rating of 488.

The important question in this study is how accurately the ELO ratings measure the strength of the various national teams. The forecasting ability of the ELO ratings, compared to FIFA's own ratings and bookmaker odds, is evaluated with data from recent World Cup matches. For each of the last four World Cup finals, a probit model is estimated with data from matches which did not end in a draw using the difference between the two teams' ELO ratings or their FIFA ratings as the explanatory variable. In the last two World Cup finals, for which pretournament bookmaker odds are available, the model was also estimated using the difference in the pretournament odds of each team winning the competition (which in an efficient capital market are the best possible forecast).

The results are reported in Table 1. The average value of the pseudo R^2 in the four regressions using the ELO measure was .2575 compared to an average of .19 with the FIFA variable. The probit models using the ELO rating predicted the match

Table 1. The Ability of Different Variables to Forecast World Cup Match Outcomes

		FIFA Ratings		ELO Ratings		Bookmaker Odds	
World Cup	*N*	Number Correct	R^2	Number Correct	R^2	Number Correct	R^2
1994	44	29	.18	31	.15	—	—
1998	48	33	.24	36	.39	—	—
2002	50	36	.13	33	.08	32	.24
2006	53	37	.21	45	.41	45	.52
Average (for four World Cups)		33.75	.19	36.25	.258	—	—
Average (WC2002 and WC2006)		36.50	.17	39.00	.245	38.50	.38

winner correctly in 145 cases as opposed to 135 cases with the FIFA rating. This indicates that before 2007 the ELO ratings were a much better indicator of national team strength than the FIFA ratings. In the last two World Cups, probit models using the ELO measure had an average pseudo R^2 of .245 (and 78 correct forecasts) as opposed to an average pseudo R^2 of .38 (and 77 correct forecasts) when the betting odds are used. Although the ELO ratings do not fit the data as well as bookmaker odds, the latter are not a time series measure of national team strength. Therefore, the ELO ratings provide the best available measure of national team strength and are used in the tests which follow.[25]

The average ELO rating for the 14 European nations is examined along with the averages for two subgroups. Group 1 consists of the so-called "Big Six" countries with the strongest domestic leagues, the highest average attendance, and apparently the greatest percentage of foreign players—Germany, England, Spain, France, Italy, and the Netherlands. Group 2 contains the remaining eight countries in the sample. Table 2 reports various statistics related to the ELO ratings of each country and the average ELO rating for all 14 European countries (labeled Europe in the table), the two groups of European countries and the average for the 10 Third World countries (labeled Third World in the table), including the first order autocorrelation of the ELO rating $\rho(1)$. The average ELO rating for the Big Six (Group 1) countries during this period, 1925, is 170 points greater than the Group 2 average ELO rating and about 100 points above the 14 country average. France's average ELO of 1955 is the highest among these countries while Austria's average rating of 1659 is the lowest. The individual country ELO figures are, in some cases, quite volatile. For example, Portugal's ELO rating ranges from 1685 to 1983 during this time period. This variation is measured by the standard deviations of the ELO ratings, which range from 78 for Portugal to 42 for England.

The average ELO ratings for the 14 countries and the two subgroups are much less variable than the individual country ELOs, indicating that tests with the

Table 2. Descriptive Statistics of the ELO Ratings

	Average	Minimum	Maximum	Standard Deviation	ρ(1)
Europe	1828	1799	1863	17	.88
Group 1	1925	1872	1979	28	.74
Group 2	1755	1722	1786	15	.82
Third World	1587	1526	1629	28	.92
Germany	1933	1815	2061	67	.73
England	1908	1833	1977	42	.67
France	1955	1805	2106	76	.74
Italy	1927	1818	2023	53	.75
Netherlands	1927	1810	2021	61	.67
Spain	1902	1791	1999	58	.82
Scotland	1720	1573	1833	59	.89
Portugal	1824	1685	1983	78	.94
Belgium	1760	1616	1846	48	.69
Sweden	1834	1731	1951	46	.54
Denmark	1849	1733	1928	46	.72
Austria	1659	1569	1775	52	.87
Greece	1666	1557	1896	77	.82
Norway	1728	1543	1897	87	.92

European and group average data should be powerful. For example, the European average ELO has a minimum value of 1799 and a maximum value of 1863 during this period, with a standard deviation of only 17. The standard deviation of the Group 1 average is somewhat greater than that of the European average but the Group 2 average is as variable as the European average. The average rating for the 10 Third World countries is as variable as the Group 1 average and ranges from 1526 (the first observation in the time series) to 1629 (the last observation). This reflects the increase in the quality of soccer outside Europe and South America during this time period. As expected, the ELO ratings are highly positively autocorrelated, with all first order autocorrelations greater than .50.

Empirical Results

The coefficient estimates and related statistics from Equation (1), when the dependent variable is the average rating for a group of countries, are reported in Table 3. The figures in parentheses are the absolute values of the t statistics and coefficient estimates which are statistically significant at the .05 (.10) level in a two-tailed test are denoted by two (one) asterisks. The χ^2 statistic tests the hypothesis that the *overall* effect of the ruling ($\alpha_5 + \alpha_6$) equals zero and is reported along with its p-value. In each case, the adjusted R^2 of the regression is greater than .60, consistent with the models having substantial explanatory power.[26] The average ELO rating for the 14 European countries and the two group averages are, controlling for other factors, significantly positively correlated with their lagged value. Two of the average ELO

Table 3. Estimates From Equation (1) for Groups of European Countries

ELO	$\hat{a}_0$	$\hat{a}_1$	$\hat{a}_2$	$\hat{a}_3$	$\hat{a}_4$	$\hat{a}_5$	$\hat{a}_6$	R_a^2	χ^2 (1)	p
Europe	1144** (6.24)	.45** (4.56)	1.17** (4.86)	−.09 (1.29)	−10.37** (3.72)	10.69** (2.75)	−33.83** (4.40)	.830	5.06	.0245**
Group 1	1471** (5.27)	.52** (5.05)	1.58** (3.66)	−.36** (2.41)	−23.33** (4.45)	21.61** (3.08)	−28.96* (1.82)	.610	.14	.7059
Group 2	621** (2.57)	.57** (5.05)	.61 (1.14)	.08 (.92)	−.25 (.05)	.92 (.12)	−28.10** (1.98)	.677	1.81	.1781

Note: The absolute value of the *t*-statistic is in parentheses below the coefficient estimate. R_a^2 is the adjusted R^2 and χ^2 (1) is the chi-square statistic to test the hypothesis that $\alpha_5 + \alpha_6$ equals zero. The *p*-value associated with the chi-square statistic is in the last column of the table.

** = statistically significant at the 5% level in a two-tailed test.

* = statistically significant at the 10% level in a two-tailed test.

ratings show a noticeable upward trend over time, although the latter effect (an increase of two to three points per year) is fairly small. The Group 1 average ELO rating is significantly negatively affected by the rise in the quality of soccer outside Europe and South America and both the European average and the Group 1 average are significantly negatively impacted by political change in Eastern Europe.

Regarding the Bosman ruling, the 14 countries were on average significantly positively affected immediately by the court decision, with the average ELO rating increasing by 10.69. However, over the longer term, Bosman significantly decreased the average ELO rating of these countries by 33.83. The overall effect of Bosman on these countries over 10 years, which is the sum of the estimates of α_5 and α_6, is an average decrease in the ELO rating of about 23 points (which is statistically significant in tests at the 5% level). While the coefficient estimates are statistically significant at well beyond the 5% level, this is partly due to the power of the tests. The overall effect for European national teams on average does not appear to be especially large. Based on recent ELO ratings a team ranked in the top 50 in the world would on average drop two or three places in the rankings—for example, the number 10 ranked national team in the world would drop to number 12 or 13 over 12 years—if its ELO rating fell by 23 points.[27]

The results for the two groups within the 14 countries provide insight into the behavior of the sample average. The Big Six countries were immediately positively affected by the ruling, with the average ELO rating increasing by more than 21 points. This estimate is reliably different from zero in tests at the 5% level. There is also a significant (at the 10% level) longer term negative effect of Bosman on these countries on average, but the overall effect of the ruling is not statistically significant. For the Group 2 countries, the estimate of α_5 is statistically insignificant but there is a significant negative longer term effect of Bosman on these countries on average. This is consistent with the national teams of the Group 1 and 2 countries being negatively impacted in the longer term by Bosman. Thus, the immediate positive impact of Bosman on European national teams is driven by the Big Six while the longer term negative effect is due to both groups of countries.

The regression results for the individual national teams are reported in Table 4. The adjusted R^2 range from .279 to .889, but they are generally above .50.[28] The coefficient estimates, including those related to Bosman, vary considerably across the sample countries. The lagged ELO rating has significant explanatory power in all 14 regressions and there is a significant time trend (at the 10% level in two-tailed tests) in the ELO rating in nine cases. Regarding the increase in the strength of national teams outside of Europe and South America, only four estimates of α_3 are statistically significant at the 10% level. Germany, Italy, and Denmark have a negative effect on their ELO rating, while Sweden's ELO increases due to changes in soccer outside of Europe and South America.

Political and economic change in Eastern Europe had a very noticeable effect on the national teams of the EU nations as 10 of 14 coefficient estimates on $D1991_t$ are

Table 4. Estimates From Equation (1) for Individual Countries in Europe

ELO	$\hat{a}_0$	$\hat{a}_1$	$\hat{a}_2$	$\hat{a}_3$	$\hat{a}_4$	$\hat{a}_5$	$\hat{a}_6$	R_a^2	χ^2 (1)	p
Germany	2579** (2.48)	.61** (3.56)	2.71** (1.98)	−1.17** (2.31)	−44.27** (2.54)	13.28 (.42)	−35.60 (.72)	.524	.14	.7078
England	1224** (2.06)	.60** (6.40)	−2.10 (1.59)	−.28 (.70)	4.07 (.25)	37.27** (2.41)	62.49* (1.66)	.421	4.19	.0407**
Spain	912* (1.91)	.39** (5.09)	3.95** (2.21)	.13 (.45)	−66.41** (2.84)	44.07** (4.28)	−129.51** (3.44)	.725	3.84	.0500**
France	1218* (1.68)	.46** (4.82)	5.60* (1.96)	−.10 (.21)	76.67** (2.82)	92.58** (2.00)	119.65** (1.83)	.570	4.10	.0429**
Italy	1244** (4.39)	.56** (6.88)	4.70** (3.97)	−.29* (1.65)	−37.86** (3.48)	−27.12** (2.15)	−93.55** (2.66)	.565	7.65	.0057**
Netherlands	1342* (1.71)	.46** (2.96)	7.03* (1.72)	−.23 (.62)	−90.64** (2.04)	−24.35 (.73)	−127.46* (1.79)	.469	2.23	.1357
Scotland	316 (.67)	.77** (6.40)	−2.73** (2.82)	.07 (.29)	36.33** (2.91)	3.10 (.23)	49.84 (1.62)	.777	2.80	.0940*
Portugal	381 (.81)	.78** (11.46)	1.82* (1.71)	−.01 (.02)	−.18 (.02)	3.94 (.23)	−40.38 (1.34)	.889	.72	.3966
Belgium	996** (2.04)	.52** (4.56)	2.95** (2.62)	−.10 (.43)	−36.80** (2.40)	−19.64 (1.60)	−112.10** (3.84)	.547	15.88	.0001**
Sweden	139 (.26)	.34** (5.92)	4.59** (2.81)	.67** (2.01)	−44.91** (2.25)	−74.48** (3.32)	−115.00** (3.25)	.279	12.10	.0005**
Norway	11 (.03)	.68** (8.72)	1.15 (.56)	.32 (1.15)	41.61** (2.12)	−16.33 (.57)	−68.55 (1.17)	.867	1.13	.2873
Denmark	1566** (3.66)	.64** (10.00)	−.50 (.39)	−.57** (2.12)	5.37 (.29)	4.41 (.34)	34.65 (1.09)	.503	1.04	.3076
Austria	820** (2.46)	.44** (4.99)	−1.51 (1.25)	.09 (.44)	−42.02** (4.15)	65.37** (3.05)	−28.53 (1.06)	.836	.66	.4161
Greece	449 (.81)	.55** (5.18)	.86 (.57)	.17 (.40)	−7.53 (.41)	−2.00 (.11)	45.62 (1.11)	.688	.73	.3930

Note: Absolute values of the *t*-statistic are in parentheses. R_a^2 is the adjusted R^2 and χ^2 (1) is the chi-square statistic to test the hypothesis that $\alpha_5 + \alpha_6$ equals zero. The *p*-value associated with the chi-square statistic is in the last column of the table.

** = statistically significant at the 5% level in a two-tailed test.

* = statistically significant at the 10% level in a two-tailed test.

reliably different from zero. Five of the Big Six countries were significantly affected by these events and four of those estimates are negative, which is reflected in the result for the Group 1 countries on average in Table 3. For the remaining eight countries three of the significant estimates of α_4 are negative while two are positive. In fact, the fall of the Iron Curtain had, based on the number of countries with significant estimates of α_4 versus those with significant estimates of α_5 and/or α_6, an impact on soccer in Europe at least as large as the Bosman ruling.

Turning to the effects of the Bosman ruling, 6 of the 14 countries in the sample were significantly affected immediately by the decision. Four of these countries are in the Big Six and, as evidenced by the Group 1 regression reported in Table 3, three of the four were positively affected. France's ELO rating increased immediately by about 93 points, Spain's increased by 44 points, and England's by 37 points, while Italy's ELO rating dropped immediately by 27 points. Among the other eight countries, Sweden was immediately negatively affected by Bosman, while Austria was positively affected. In the longer term, England and France were positively affected by Bosman. Spain, Italy, the Netherlands, Belgium, and Sweden were significantly negatively affected, however, with each losing between 90 and 130 points in their ELO ratings over the longer term.

The estimated overall effect of Bosman is statistically significant for seven countries. England gained 100 (ELO) points, Spain lost 85 points, France gained 212 points, Italy lost 121 points, the Netherlands lost 152 points, Belgium lost 132 points, Scotland gained 53 points, and Sweden lost 189 points. Sweden, not one of the Big Six, was the most negatively affected by Bosman. Conversely, there is no evidence that England, the source of the loudest complaints about the elimination of quotas on foreign players, was negatively affected. In fact, the English national team was stronger after Bosman than before. England's poor results in *some* matches recently, such as during the qualifying for Euro 2008 and to an extent at the 2006 World Cup, appear to be due to an inability to shine in critical situations as opposed to a lack of talented players. If the Bosman ruling hurt the growth of domestic talent anywhere, from these results it was in Spain, Italy, the Netherlands, Belgium, and Sweden, not in England.

Based on the evidence presented here, what conclusions can be drawn about the effects of Bosman on national teams in the EU countries? First, the effects appear to be variable. Some countries were positively impacted while others were negatively affected overall, as opposed to Frick's (2009) finding of no effect. Therefore, it is fruitful to examine individual countries as well as the average effects, because the individual results vary noticeably around the average. Inconsistent with Baur and Lehmann (2008), the European countries were negatively affected on average by the end of the time period. In the big picture, the average effect on the 14 EU countries over the entire 12-year period, while statistically significant, was fairly small, which is consistent with Frick (2009). Also, any negative impact of Bosman on some European national teams must be weighed against the positive impact on others and the positive effects the removal of foreign player quotas have had on the market for players and the increased

quality of soccer played by the top clubs in Europe, as evidenced by the Champions League competition.

Competitive Balance at the Club Level

It has long been recognized (see Rottenberg, 1956; Neale, 1964) that professional sports differs fundamentally from other industries. In the standard industry, it is of little concern if some competing firms are better (more efficient) than others. In fact, this is to be encouraged because societal welfare is maximized by increasing efficiency (lowering production costs). However, the degree of interest in professional sporting events, and therefore the success of a league overall is positively related to how competitive the teams are because fans are not interested in competitions with very predictable or very lopsided outcomes.

Vrooman (2007) proposes three separate measures of competitive balance: (a) the variability of performance across teams in the league (''across team'' competitive balance); (b) the continuity of team performance over time (''across season'' competitive balance); and (c) the extent to which certain teams dominate the league (''league dominance''). If in each season there is a wide dispersion in team strength (and therefore the final results, measured in soccer by a statistic such as total points earned) then many matches will be one sided and fan interest in those matches will be fairly low. Similarly, if each club finishes in roughly the same place in the league year in and year out, the season is fairly predictable and the fans will find the competition uninteresting. Regarding league dominance, if the same teams finish atop the league on a regular basis then the battle for the championship will be very predictable, which can negatively affect fan interest in the league overall. These three aspects of competitive balance are empirically examined for the domestic leagues of the sample countries before and after Bosman. Furthermore, because the UEFA Champions League is a club competition which overarches the various domestic leagues, we also examine dominance in that league.

To examine whether the Bosman ruling increased the stratification within the domestic leagues in Europe, data are collected on the number of points earned by each team in the top league in the 11 sample countries for the seasons ending from 1984 to 2007 and the variance of this variable is estimated before and after Bosman.[29] In this analysis each team is awarded three points for a win and one point for a draw, which standardizes the data across leagues and over time. The dispersion across teams of the number of points earned may change over time, however, simply because the number of teams in the league changes. For example, the English Premier League consisted of 22 teams from 1984 to 1987 and from 1992 to 1995, 21 teams in 1988, and 20 teams from 1989 to 1991 and again from 1996 to 2007. To avoid this problem, we use only the years where the number of teams in the league is the same and choose the league size which yields the most years of data. For example, in England we pool the 60 observations for the years 1989-1991 to measure the variance of points earned before

Table 5. Variance of Points Earned in Each League (Across Teams) Before and After Bosman

Country	Teams	s_1^2	s_2^2	N_1	N_2	*F* Statistic
Germany	18	147.66	157.66	197	197	1.0673
England	20	163.20	223.87	59	219	1.3718
France	20	148.06	148.52	239	119	1.0031
Italy	18	200.93	172.68	125	143	1.1636
Netherlands	18	227.82	267.31	215	197	1.1733
Spain	20	199.81	157.68	159	199	1.2672
Portugal	18	216.23	204.31	89	179	1.0583
Belgium	18	219.71	218.73	215	179	1.0045
Sweden	14	110.45	93.77	41	153	1.1779
Austria	10	238.05	205.66	19	109	1.1575
Greece	16	165.38	249.46	95	95	1.5084**

Note: s_1^2 and s_2^2 are the estimated variances before and after Bosman. N_1 and N_2 are the degrees of freedom in the variance estimates before and after the Bosman ruling, respectively. The *F*-statistic is the larger variance estimate divided by the smaller.
** = statistically significant at the 5% level in a two-tailed test.

Bosman and the 240 observations from 1996 to 2007 to estimate the post-Bosman variance. Following Haan et al. (2008), we conduct two-tailed tests of statistical significance when testing whether competitive balance changed.

The results, along with the *F*-statistic testing the hypothesis that the variance changed after the Bosman ruling, are reported in Table 5.[30] In 5 of 11 countries, the variance estimate increased after Bosman and in six countries it decreased. However, only in Greece is there a significant (in two-tailed tests at the 10% level) change in the variance of points earned across teams. Therefore, consistent with Haan et al. (2008), there is little evidence to support the claim that stratification within the various domestic leagues has increased, that is, competitive balance across teams has decreased. Certainly there is no widespread decrease in this type of competitive balance in the top six European leagues.

The variance results are somewhat surprising, at least for England, because the rich (based on casual observation) do appear to have gotten richer there post-Bosman as Arsenal, Chelsea, Liverpool, and Manchester United perennially battle for the top three places in the league. The variance would not increase noticeably, however, if the top teams became stronger (earned more points) while the rest of the league remained essentially unchanged. In England, most teams have improved by adding foreign players since the Bosman ruling, not just the teams at the top, and therefore the poor have not necessarily gotten poorer. This is reflected in the fact that the bottom three teams in the league earned 32.25 points on average after Bosman compared to 33.56 points before while, consistent with greater dominance by a few clubs, the average points earned by the top three teams increased from 72.89 to 78.19 after the Bosman ruling.

Table 6. Variance of the Across Season Change in Points Earned Before and After Bosman

Country	Teams	s_1^2	s_2^2	N_1	N_2	*F* Statistic
Germany	18	104.06	122.65	140	164	1.1786
England	20	165.83	103.18	33	186	1.6072*
France	20	112.72	106.98	188	84	1.0537
Italy	18	113.19	114.45	69	111	1.0111
Netherlands	18	84.02	127.20	167	161	1.5139**
Spain	20	114.25	112.28	119	151	1.0175
Portugal	18	57.65	116.83	47	149	2.0265**
Belgium	18	146.46	133.79	174	173	1.0947
Sweden	14	112.14	80.79	23	125	1.3880
Austria	10	282.13	136.91	7	96	2.0607
Greece	16	150.87	95.06	67	52	1.5871*

Note: s_1^2 and s_2^2 are the estimated variances before and after Bosman. N_1 and N_2 are the degrees of freedom in the variance estimates before and after the Bosman ruling, respectively. The *F*-statistic is the larger variance estimate divided by the smaller.
** = statistically significant at the 5% level in a two-tailed test.
* = statistically significant at the 10% level in a two-tailed test.

We examine across season competitive balance with the data used to construct Table 5, except the variable of interest is the change in the number of points earned by each team between consecutive seasons.[31] The results are reported in Table 6. In four countries the estimated variance of the across season point change increased after Bosman and in seven countries it decreased. However, only four of these changes are statistically significant in two-tailed tests at the 10% level. In England, consistent with casual observation, and Greece the variance decreased significantly, indicating that club performance became less variable over time and that competitive balance of this type decreased. However, in the Netherlands and Portugal club performance over time was significantly more variable after the ruling. Overall, Bosman did not noticeably increase or decrease this type of competitive balance in the European domestic leagues, which is consistent with the results in Haan et al. (2008).

To examine whether these leagues became more heavily dominated by the same teams after Bosman, data were collected on the top three clubs each year for the 11 seasons before Bosman (1984/1985-1994/1995) and the 11 years after (1996/1997-2006/2007). For each of these seasons, we count how many of the clubs in the top three spots also finished in the top three the preceding season. The number of times the same club was in the top three in the league for two consecutive seasons (out of a possible 33 times) before Bosman, N_1, and after Bosman, N_2, along with the percentage of cases in which this occurred, p_1 and p_2, are reported in Table 7. Before Bosman, league dominance by the same teams was weakest in Germany (with N_1 equal to 12). On the other hand, in the Netherlands in 29 of 33 cases ($p_1 = .88$), the clubs finishing in the top three places in the league also did so during the preceding

Table 7. League Dominance Before and After Bosman

Country	N_1	N_2	p_1	p_2	t Statistic
Germany	12	19	.36	.58	1.80*
England	13	25	.40	.76	3.13**
France	19	14	.58	.42	−1.29
Italy	14	19	.42	.58	1.29
Netherlands	29	23	.88	.70	−1.81*
Spain	22	15	.67	.45	−1.82*
Portugal	19	20	.58	.61	.24
Belgium	27	27	.82	.82	.00
Sweden	13	13	.40	.40	.00
Austria	23	20	.70	.61	−.76
Greece	20	29	.61	.88	2.60**

Note: N_1 and N_2 are the number of times a club finishes in the top three places two consecutive years before and after Bosman, respectively, and p_1 and p_2 are the percentage of times each outcome occurs.
** = statistically significant at the 5% level in a two-tailed test.
* = statistically significant at the 10% level in a two-tailed test.

season. After Bosman, Greece was the most dominated at the top by the same teams ($p_2 = .88$). In five cases, dominance at the top increased ($p_2 > p_1$) after Bosman, while it decreased in four cases. The greatest decrease was in Spain while, again consistent with casual observation, the greatest increase was in England.[32]

A few further words on the subject are in order. Casual observation seems to indicate that as in England, other leagues are dominated by a few teams. This is true in Scotland where Glasgow Celtic and Glasgow Rangers have virtually monopolized the top two positions in the league. In fact, since 1985, no other team has won the Scottish league title and only twice have these two clubs not occupied the top two positions in the league. However, this has been the case throughout the sample period and is not, therefore, due to the Bosman ruling. Similarly, the Dutch domestic league has for years been dominated by Ajax Amsterdam, PSV, and Eindhoven.

The t-statistic to test the hypothesis that p_2 equals p_1 is reported in the last column of Table 7.[33] In two-tailed tests at the 10% level, the null hypothesis of no change in competitive balance of this type (league dominance) is rejected for five countries. Competitive balance decreased in England, Germany, and Greece but increased in Spain and the Netherlands after Bosman, indicating that dominance by the same teams did not noticeably increase or decrease in Europe on average.[34] This conflicts with the conclusion by Haan et al. (2008) that league dominance increased somewhat after the ruling.

Based on the results of these three tests, overall competitive balance within Europe's domestic soccer leagues has not been damaged by the Bosman ruling, including in the Big Six. A separate issue is whether the flow of top players to the biggest clubs, many of which are in the Big Six countries, has caused some clubs/leagues in Europe to become stronger at the expense of others. Casual observation, based on the domination of the

Champions League by clubs from the Big Six since the Bosman ruling, seems to confirm that this type of stratification has occurred. This is misleading, however, because (as mentioned above) the format of the Champions League—possibly in response to the effects of Bosman—was altered for the 1997/1998 season. Previously, only one team from each domestic league, the winner the preceding year, was entered in the Champions League (along with the winner of the previous year's Champions League final). In the 1997/1998 competition the runners-up from the top eight leagues the previous year were also included. Currently, some domestic leagues send their top four teams to the Champions League.

To examine the effect of Bosman on the Champions League, we adjust the data to control for the change in the format. That is, from the 1956/1957 season to the 1996/1997 season, we count the number of semifinalists each year from the Big Six.[35] From the 1997/1998 season through the 2006/2007 season, we first eliminate the semifinalists who would not have qualified for the competition under the pre-1997/1998 format. That is, they were not (a) champions of their domestic league or (b) winners of the Champions League the preceding year.[36] We then count how many of the semifinalists who entered the competition in the traditional way were from the Big Six. Prior to the Bosman ruling, 102 of 156 semifinalists (about two-thirds) were from the Big Six, indicating that domination by teams from these countries is not an entirely new phenomena. From 1995/1996 to 2006/2007, 23 of 26, or 88% of the semifinalists were from the Big Six. The *t*-statistic to test the hypothesis that the probability did not change is 3.10, which rejects the null hypothesis of no effect due to Bosman at well beyond the 1% level.[37] Clearly, the influx of top players to these countries has helped their clubs noticeably in soccer's most prestigious club competition.

This increased stratification across club teams in the Europe is not necessarily bad, however. First, it creates all-star type teams where the 11 starting players, and in some cases all the rostered players, are outstanding. When these teams meet, just as when national teams meet in the World Cup, spectators see the highest form of the art. Second, its effects are seen only in the Champions League, which is a cup type of competition, similar to the cups in the various domestic soccer leagues. One feature of cup competitions which makes them more exciting and increases spectator interest is the fact that they pit the Davids against the Goliaths and the Davids sometimes win. For example, the domestic league cups in Europe include clubs from lower professional leagues as well as amateur clubs. The Bosman ruling, because it increased the stratification across leagues, has amplified this variability within the Champions League. Similarly, the creation post-Bosman of some four all-star teams in the English Premier League has made it the world's most watched sporting league.[38] Although it is fairly predictable which clubs will finish in the top four spots, it is not clear which one will win the championship. To the extent that the flow of talent to England, the other Big Six countries and the top teams in the Champions League has increased interest in the game in North America and Asia, the Bosman ruling has been a great success in terms of promoting football in those regions.

Conclusion

While there has been considerable discussion about the effects of the Bosman ruling, by academics, club and federation officials, players, and spectators, there have been only a handful of empirical studies of its effects on national and club teams in Europe. We find that while some national teams were negatively/positively affected by Bosman, the average effect on the Big Six countries (which apparently have had the greatest influx of high-quality players) and other European nations was fairly small. Certainly, the Big Six as a whole, including England, have not been greatly affected.

At the club level, competitive balance in the domestic leagues, measured in any of several ways, has not decreased overall (although England, which has been the subject of the most discussion, has clearly been affected). That is, imported players have gone to a variety of clubs, not just the top teams, largely preserving the competitiveness of the various leagues. The clubs have become more stratified across countries with teams from the Big Six more heavily dominating the Champions League, since the decision in Bosman. The free flow of players has, however, turned the Champions League, and some of the domestic leagues, into virtual super leagues, showcasing a number of "all-star" teams which has also greatly increasing interest in the game worldwide.

All things considered, the negative effects of Bosman appear to be fairly small. Furthermore, they must be balanced against the ruling's positive effects, including those on the market for players and interest in soccer around the world. Hopefully, this article and further empirical research on the subject will provide evidence useful to policy makers in various countries as well as broader governing bodies such as UEFA, FIFA, and the EU parliament. Furthermore, if the decrease in the quality of some European national teams is an important concern, it can be addressed without restricting the movement of players (as Joseph Blatter's "6 + 5" proposal would do). One alternative is for UEFA to impose a lump-sum "tax" on the Champions League and UEFA Cup revenues and transfer this money, based on how many players from each country play their club soccer for a top team abroad, to the countries exporting these players for further training and development of their national teams.

Notes

1. Garcia (2007) provides an excellent discussion of these and other issues confronting UEFA and the EU.
2. See http://www.majorleaguecharts.com/mlc/index.cfmed and also "Fact Sheet 16: The Bosman Ruling, Football Transfers and Foreign Footballers."
3. On December 26, 1999, Chelsea was the first English team to field an entirely non-English starting 11. Almost 6 years later, Arsenal FC was the first English club to name an entire squad of 16 without a domestic player.
4. See, for example, the papers in Jeanrnaud and Kesenne (1999) and the literature surveys in Frick (2007, 2009).

5. A similar argument appears in Milanovic (2003).
6. This argument is also made by Frick (2009).
7. See Greg Hurst and Matt Dickinson, "Minister Gerry Sutcliffe Risking Another Own Goal Joining the Debate Over Imports" *Times Online*, November 11, 2005.
8. Mike Collett, "English FA Set Capello Semi-Final Target" *Yahoo Sports*, May 6, 2008.
9. "Blatter Wants Limits on Foreign Talent" *Times Online*, October 5, 2007.
10. This "spillover" hypothesis is also advanced by Baur and Lehmann (2008, pp. 2–3).
11. See, for example, Jon Bramley, "England's Golden Boys Turn Out To Be Tin Men" *Manchester Guardian*, November 22, 2007.
12. See David Conn, *The Guardian*, October 12, 2005.
13. This quote is from the article "Half-full Blatter" SI.com, October 13, 2005. See also "UEFA to Discuss Bosman Drawbacks" *BBC Sport Football*, December 15, 2005.
14. See Steve Brenner, "Kevin Keegan Claims the Premier League is Boring but Great" *The Sun*, May 6, 2008.
15. More recently, Flores, Forrest, and Tena (2010) examine within and across season competitive balance for 14 domestic leagues in Europe. They conclude that competitive balance increased within season after Bosman and they find some evidence that it decreased across season, that is, team outcomes became less fluid, following the loosening of the nationality restrictions.
16. Norway is a member of the European Economic Area, which consists of Norway, Iceland, Lichtenstein, and the EU countries. No cross border work permits are required among the EEA countries, so Norway was affected by Bosman in the same manner as the EU countries and is included in the sample.
17. The data are from a wikipedia article on attendance at domestic professional sports leagues. Poland and Romania are among the 20 leagues with the highest attendance in Europe, but they are excluded from the sample because they joined the EU in 2004 and 2007, respectively. Similarly, Switzerland, which has a bilateral agreement with the EU since 2002 regarding entry and employment, is excluded from the sample.
18. We also estimate a variant of Equation (1) which includes two lags of the ELO rating as explanatory variables. Only the coefficient estimates on the first lag of ELO_t are statistically significant.
19. We focus on 1991 because the Soviet Union's Eastern European satellites, such as Poland and Romania, gained their freedom in 1990 while various Soviet republics, such as the Ukraine, separated from Russia in 1992.
20. Several alternative specifications of Equation (1) are also estimated. They allow $D2_t$ to increase right after Bosman (in March 1996) or 4 years after Bosman (in March 2000), they have the step up in $D2_t$ to occur over 8 or 12 years rather than 10 years or $D1_t$ equals one starting in March 1997 or March 1998 as opposed to March 1996. The results are qualitatively similar to those reported below.
21. The ratings are available at http://www.eloratings.net and were created using data supplied by Advanced Satellite Consulting. The 10 Third World countries are New Zealand, Angola, Iran, Saudi Arabia, Canada, Honduras, the United Arab Emirates, Morocco, Mexico, and Guatemala.

22. Before German reunification, Germany's ELO rating is that of West Germany. Similarly, the rating for the USSR is used as the rating for Russia before the break up of the Soviet Union. Any change in the series due to these political changes is measured by the coefficient on $D1991_t$.
23. A detailed description of the ELO methodology, including the equation used to revise each country's rating, is available at http://www.eloratings.net/system.html.
24. The highest ELO rating ever, 2,165, was achieved by Hungary in 1954.
25. The odds also capture other factors unrelated to overall national team strength, such as weather, altitude, and field conditions, which can be used to forecast match outcomes.
26. The Durbin–Watson statistics are close to two, indicating that the residuals are not first order autocorrelated. The Box–Ljung statistics show little evidence of higher order autocorrelation. Also, the standard errors of the coefficient estimates are corrected in the RATS software package for heteroskedasticity and autocorrelation.
27. On April 24, 2008, Brazil (ranked number 1 in the world) had an ELO rating of 2062, while Guinea (ranked number 51) had a rating of 1609. Therefore, on average the top 51 national teams were separated from the next highest rated team by about nine ELO points.
28. Most of the Durbin–Watson statistics are close to two.
29. Denmark and Norway are dropped from the analysis because there are not two or more seasons before the Bosman ruling (the season ending in 1995 or before) where the league had the same number of teams as after the ruling. Scotland is excluded because starting in 2001 the domestic league broke into two divisions after 33 matches. The season during which the Bosman ruling became effective, 1995-1996, is left out of the analysis.
30. Because the F-distribution is not symmetric and significance is determined using tables based on its right tail, in each case the larger variance estimate (regardless of whether it comes before or after Bosman) is divided by the smaller estimate to calculate the F-statistic. The critical value is that for α (the size of the two-tailed test) divided by two, as in a two-tailed t-test.
31. For example, Arsenal earned 76 points in the English Premier League in 1989 and 62 points in 1990. Therefore, the observation for Arsenal in 1990 equals –14. To be included in the sample for year t, the club must have been in the league during year t and $t - 1$. The change between season ending in 1995 and the one ending in 1996 is excluded from the analysis because the Bosman ruling occurred during the latter.
32. The top three results are not affected by changes in league size because adding or subtracting teams to the league essentially impacts only the bottom of the league table.
33. Because the variable of interest (whether a club finishing in the top three did so the previous season) is Bernoulli distributed, p_2 and p_1 are estimates of the mean of the distribution before and after Bosman. By the Central Limit Theorem, p_2 and p_1 are asymptotically normally distributed and a standard t test of the hypothesis that the means are equal is appropriate.
34. The significant results for England in Tables 6 and 7 may, in fact, be due to the formation of the English Premier League in 1992, which decreased the sharing of television revenues among the clubs. Therefore, the effects of Bosman on the domestic leagues may be even smaller than the tests in Section 3 indicate.

35. The initial 1955/1956 season is excluded because the 16 entrants included only 7 league champions.
36. Before 1997/1998, if the winner of the Champions League the previous year also won its domestic league, the second place finisher in the latter automatically qualified for the Champions League. We include these teams when tabulating the semifinalists from Big Six countries beginning with 1997/1998.
37. If we exclude the 5 years beginning with the 1985/1986 season, when English clubs were banned from European competitions following the Heysel disaster, before Bosman 92 of the 136 semifinalists (.676) in the Champions League were from the Big Six and the *t*-statistic testing the hypothesis that the percentage changed after Bosman equals 2.77.
38. Dennis Campbell, "United (versus Liverpool) Nations" The Observer, January 1, 2002.

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