Scoring goals: The impact of English Premier League football teams on local university admissions

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Abstract

Anecdotal evidence suggests that co-location with an English Premier League (EPL) football team can boost university recruitment. But when a town or city loses its EPL team, it also loses some of the world's attention. We test whether the EPL limelight does in fact affect university recruitment in England and Wales. We exploit the sharp annual cutoff between survival and relegation from the EPL, comparing the admissions outcomes of universities that have clear name association either side of that discontinuity. On average, losing association with an EPL team, for just one year after its relegation, significantly reduces a university's undergraduate year-to-year admissions growth by 4-8 percent. These findings suggest not only that the EPL generates local externalities but also that university executives should support their local teams.

Keywords: professional football, relegation, local economy, regression-discontinuity design, higher education demand
JEL codes: I20, R19, Z20

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1 Introduction

The English Premier League (EPL) is a pinnacle in professional sports, dominating both viewership and revenue generation within the United Kingdom, while also being the most watched annual sports league worldwide (Deloitte, 2023). But, each year, three of the twenty member teams of the EPL are relegated, dropping for at least one year into relative obscurity. It stands to reason that the locales of those teams, the towns or cities that normally share their names, would then also get reduced attention, mainly due to the fact that the team will be discussed on television and other media much less.

Some organisations share the same association to locales and affinity with place as football teams. This includes universities. We test whether association with a successful football team, that shares a name and place, affects those universities' undergraduate admissions, from which British universities tend to derive a majority of their income (Bell et al., 2022). In terms of international reach, the UK is currently the second most popular destination for higher education behind the US. There are many studies investigating what drives student recruitment to particular UK universities (e.g., Broecke, 2015; Gibbons et al., 2015; Soo and Elliott, 2010; Soo, 2013). These have focused on university groupings, brand, marketing, league tables, student satisfaction, and research excellence, using metrics such as the annual National Student Satisfaction survey and the Research Evaluation Framework. But there is also belief and anecdotes that universities get a boost when their local football team is doing well by, for instance, winning the league, winning a cup, or gaining promotion.[1]

We exploit the sharp cutoff caused by relegation from the EPL, to compare the outcomes for universities associated by name with teams that survived relegation with those associated with teams that failed to avoid the drop. This quasi-experimental, regression discontinuity design (RDD) has been used by Brachert (2021) and Speer (2023), across the major European football leagues, to study local macroeconomic effects and long-term impacts on football teams themselves, respectively (for a review of RDD, see Lee and Lemieux, 2010).

We find that, on average, having affinity with a place and team that loses EPL membership, for at least one season, leads to a 4-8 percent fall in total undergraduate admissions. When looking specifically at non-UK admissions, we find no evidence of such an effect. These results suggest that a place may be more attractive for prospective students when there is a local football team in the EPL. However, the exact mechanism for this externality — success in the EPL affecting local universities — is beyond the scope of this short paper.

Our findings contribute to the literature on the interplay between sports culture or investment and local economic outcomes (e.g., Baade et al., 2011; Coates and Humphreys, 1999; Storm et al., 2020). We also add to discussion about the economic ramifications of places hosting major sporting events (e.g., Baade and Matheson, 2016; Feddersen and Maennig, 2012). There is an established literature,

[1]This was widely discussed when Leicester City unexpectedly won the EPL. Both of the associated Universities, University of Leicester and De Montford University Leicester, reported large rises in student recruitment: "Foreign students want to study in Leicester after Premier League win", https://inews.co.uk/news/..., and "Leicester universities' global goals after football triumph", https://www.bbc.co.uk/news/business-36248794.

from North America, that finds significant links going from the athletic performance of college sports programmes towards the quality and quantity of applications those colleges receive (e.g., Caudill et al., 2018; Mixon Jr, 1995; Murphy and Trandel, 1994; Pope and Pope, 2009, 2014). To the best of our knowledge, only one other study has linked European professional football performance with local university outcomes. Weimar and Schauberger (2018) found evidence that enrolment in the following semester was affected by the promotion or relegation of the best local football team, using a dynamic panel regression model. This aligns with our findings, from a quasi-experimental design, for the EPL and universities in England and Wales.

2 Empirical strategy

At the end of each EPL season in May, the bottom three teams in positions 18-20 are relegated to the second tier of the football pyramid, where they then play for at least one year; they have the opportunity to earn promotion back to the EPL the following spring. The final positions in the EPL are determined by cumulative points over 38 games. The final margin between teams finishing 17th and 18th is often a handful of points, such that, relegation is rarely determined before the final matchday of a season.[2] As a baseline, we compare the outcomes of the universities represented in positions 15-17 above the cutoff, the control group, with those represented in the three relegation positions, the treatment group. Our identification, therefore, is based on the assumption that the universities represented on either side of the relegation cutoff in the EPL generally had similar admissions prospects before a relegation event occurred. We later test this assumption for three major factors that could influence admissions outcomes in our sample period: distance from London, population of the town/city according to the UK Census 2011, and average recent (2017-2022) QS World University Ranking. It is plausible that university admissions prospects are correlated with their EPL team's league performance, besides the cutoff. As such, in our RDD design, we use the EPL finishing position as the variable that determines treatment, the so-called running variable. Our strategy is similar to those used by Speer (2023) and Brachert (2021). They also used a fuzzy regression-discontinuity design based around promotion to the EPL, which does not have a sharp cutoff because of an end-of-season playoff system determining the third of three teams moving up a division. We prefer to focus on the sharp relegation cutoff only, given we are constrained here by needing to match a university to just one football team — going further down the football pyramid leads to sparser treatment and control groups.

Figure 1 illustrates our identification strategy, based on the timing of EPL outcomes and the university admissions process in the UK. In May of year $t-2$, we observe the relegated and surviving football teams. The former will then spend the following season out of the EPL, between August of $t-2$ and May of $t-1$. University admissions are completed in September/October of each year,

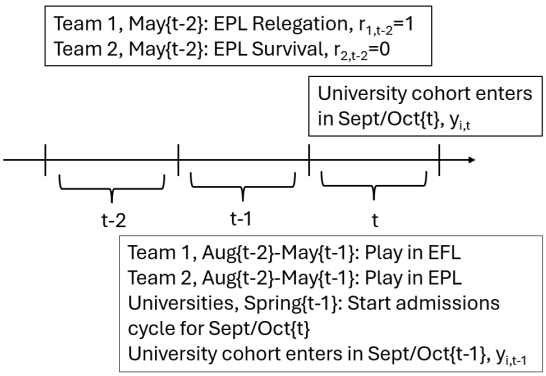
[2] Reade and Garcia-del Barrio (2023) document that relegation is generally only determined in the week that a season ends; in only seven EPL seasons out of the last 19 has it been known before this point. More broadly, the gap between the team in 17th and 18th since 1995, when the EPL became a 20-team competition, has been three of fewer points in 20 of the 28 seasons; teams earn three points for each win they achieve. In six of those 28 seasons, the gap was zero points, hence determined by another tie breaker — the gap between goals scored and goals conceded over the season.

with applications, offers, and student decisions all happening over the preceding 12-18 months. Admissions outcomes in September/October of $t-1$ may have been affected by the relegation of the local football team in May of $t-2$, but the impacts of relegation vs survival, i.e., not appearing in the EPL for at least one season, would have played out concurrently with the admissions cycle (visit and open days in summer of $t-2$, application deadlines in winter of $t-1$, and offers and decisions in spring of $t-1$). So, our main hypothesis is that any effects, from a team being relegated and spending a team in a lower division compared with another team that survived, need at least a full admissions cycle, manifesting in September/October t outcomes. It is though also possible that a team bounces back to the EPL through achieving promotion in May of $t-1$, which could offset some of the effects of the previous year's relegation. We test this by estimating the following regression model using least squares:

$$y_{i,t} = \alpha + \beta_1 \text{Relegated}_{i,t-2} + \beta_2 \text{Position}_{i,t-2} + \beta_3 \text{Bounceback}_{i,t-1} + f(t) + \varepsilon_{i,t} \ , \tag{1}$$

where $y_{i,t}$ is the admissions outcome variable for university i in year t. $\text{Relegated}_{i,t-2}$ is our treatment variable, taking the value of one if the university's football team was relegated and spent the previous season outside of the EPL, or zero if the team instead survived and remained in the EPL. We use our estimates of β_1 to test our hypothesis that having a local team relegated from the EPL affects university admissions outcomes. $\text{Bounceback}_{i,t-1}$ is a dummy variable that allows us to test whether the relegation treatment effect is reduced when the team bounces straight back to the EPL the year after relegation. $\text{Position}_{i,t-2}$ is the finishing position of the university's EPL team. We allow for the possibility of some time trend or year-specific effects in overall nation-wide admissions outcomes, represented above as the generic function $f(t)$. $\varepsilon_{i,t}$ gives the remaining heterogeneity in outcomes. We choose to estimate regular robust standard errors, since there are too few points on our running variable to cluster at that level.

FIGURE 1: Illustrative timeline of relegation from the EPL and the university undergraduate admissions cycle



3 Data and Estimation

We collected data on annual admissions outcomes for UK universities, for entry cohorts between 2002 and 2020, via the Higher Education Statistics Authority (HESA; hesa.ac.uk). The final tables for EPL seasons were compiled from worldfootball.net. For each football team that appeared in the EPL seasons 2000/01-2019/20, we manually checked whether they could be directly linked by name association and locale to one or more current universities. We excluded all small universities (e.g., arts colleges) that never had more than 7,000 total admissions in any year of the sample period. We excluded all teams based in Greater London, given the difficulty of associating them with any one university. We also excluded Manchester United and Manchester City for the same reason. Given our RDD approach, we then considered only teams and their university partner that finished a season of the EPL in positions 15-20 at least once during the sample period. This criterion dropped Liverpool out of our estimation samples. The resulting selected sample of football team (20) and university pairs (25) is summarised in Table 1; Birmingham, Cardiff, Leeds, Leicester and Southampton each appear in two pairs. The final columns of Table 1 show the number of times each pair was represented in EPL finishing positions 15-17 and 18-20 between 2001 and 2018, which constitutes our main estimation sample.

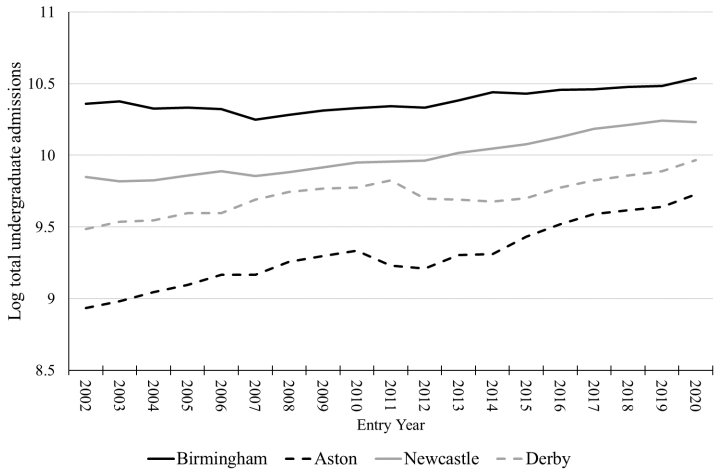
We focus on undergraduate admissions, which predominate in terms of both numbers and revenue for the vast majority of UK higher education institutions (Bell et al., 2022). Admissions numbers have generally grown over the sample period, driven by factors such as internationalisation, demographics, and a higher proportion of UK school-leavers going to university. This is illustrated in Figure 2 for four selected universities in our sample, ranging from the relatively small Aston University to the much larger University of Birmingham. Consequently, we focus on total admissions growth, specifically the year-to-year log change, as our outcome variable y_{it}.[3] Figure 3(a) shows distributions of this variable for 2003-2020, comparing where universities were associated with a team that was relegated two years previous and where the associated team survived in positions 15-17. The distribution for the latter is generally to the right of the former, suggesting that universities whose EPL team survived experienced higher admissions growth than their competitors whose teams were relegated. Figure 3(b) demonstrates that this pattern persists after removing a general quadratic time trend from the admissions growth numbers. These patterns are also confirmed in Online Appendix Figure A2 around the relegation cutoff, where we show an RDD-stlye plot of sample means for our main outcome variable, according to the EPL finishing positions of the associated football teams two years previous.

[3] Online Appendix Figure 2 shows more variable time series of non-UK undergraduate admissions, for the same four selected institutions. Non-UK admissions for some universities in our sample are small, particularly earlier in our sample period.

TABLE 1: Sample universities and EPL team pairs: number of observations in the dataset according to EPL finishing position in 2001-2018

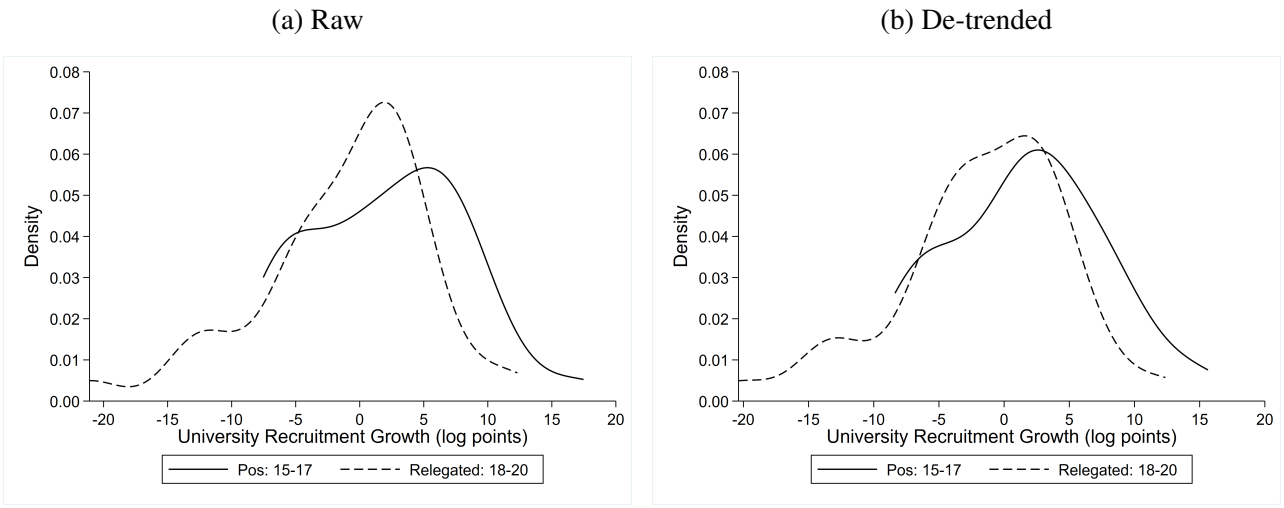
Football Team	University	1-20	15-17	18-20
Aston Villa	Aston University	16	6	1
Birmingham City	Birmingham City University	7		3
Birmingham City	University of Birmingham	7		3
Bolton Wanderers	University of Bolton	11	3	1
Bournemouth	Bournemouth University	3	1	
Bradford City	University of Bradford	1		1
Brighton & Hove Albion	University of Brighton	1	1	
Cardiff City	Cardiff Metropolitan University	1		1
Cardiff City	Cardiff University	1		1
Coventry City	Coventry University	1		1
Derby County	University of Derby	3	1	2
Huddersfield Town	University of Huddersfield	1	1	
Hull City	University of Hull	5	2	3
Leeds United	Leeds Beckett University	4	1	1
Leeds United	University of Leeds	4	1	1
Leicester City	University of Leicester	7		2
Leicester City	De Montfort University Leicester	7		2
Newcastle United	Newcastle University	16	2	2
Portsmouth	University of Portsmouth	7	2	1
Reading	University of Reading	3		2
Southampton	University of Southampton	11	1	1
Southampton	Southampton Solent University	11	1	1
Sunderland	University of Sunderland	13	6	2
Swansea City	Swansea University	7	1	1
Wolverhampton Wanderers	University of Wolverhampton	3	2	1
Total		151	32	34

FIGURE 2: Total undergraduate admissions by entry year for selected universities



Notes: author calculations using data collected from Higher Education Statistics Agency (HESA); www.hesa.ac.uk. Natural logarithm of raw totals for University of Birmingham, Aston University, University of Newcastle, and University of Derby.

FIGURE 3: Distributions of year-to-year log change in total undergraduate admissions, 2003-2020 according to the finishing position of the associated EPL team



Notes: author calculations using data collected from hesa.ac.uk and worldfootball.net. The densities are estimated with Epanechnikov kernel and automatic Silverman plugin bandwidth. The change in admissions between t and $t-1$ is compared with finishing position of teams in $t-2$ (see Figure 1). (a) uses raw year-to-year log changes in admissions. (b) uses the residuals from regressing all the raw year-to-year log changes in the full sample (see Table 1) on a quadratic time trend.

4 Results

The first four columns of Table 2 show the results of estimating Equation (1). With no control for a time trend, column (I) shows that the relegation of an associated team from the EPL significantly decreases total university admissions growth by seven log points. In column (II), controlling for a quadratic time trend, this estimated effect of relegation is 6.5 log points and statistically significant at the 5% level. Column (III) shows results where we also control for the ten instances in the estimation sample where a team bounced back to the EPL one year after relegation. In this case, the estimated effect of relegation alone, $\widehat{\beta}_1$, is significant at 8.4 log points. This is offset by a bounceback effect, $\widehat{\beta}_3$, of 4.5 log points, to the extent that we cannot reject a null hypothesis of no effect on university admissions where the EPL team was relegated but bounced back the following year.[4] Column (IV) shows results after replacing the quadratic trend with year-specific fixed effects. In this case, the estimated effect of relegation on university admissions outcomes remains negative, at 4 log points, but is statistically insignificant. It is possible that this reflects some over-fitting, given our fairly small estimation sample and including an additional 16 parameters in the model. In all three specifications, there is no evidence that the EPL position running variable is associated with admissions growth.[5] Columns (V-VII) show results of estimating the same specifications as columns (I-II & IV), but only lagging the relegation event relative to the admissions outcomes by a single year. Unsurprisingly, given the timing we discussed above, the estimated effects of relegation in these models are attenuated and insignificant from zero.

Online Appendix Table A1 shows estimates of the RDD with undergraduate admissions growth for all non-UK and only non-UK and non-EU students as the outcome variables. Like our main results in Table 2 for total admissions growth, the estimates of β_1 are negative for all four specifications of the model, and for both sub-categories of students, but they are not statistically significant from zero. Online Appendix Table A2 shows our main findings are robust when we combine the admissions numbers where two universities are associated by name with one football team (i.e., we add the admissions totals for Leeds Beckett University and University of Leeds), and re-estimate our main specifications. In Online Appendix Table A3, we show results where we increase the bandwidth of the RDD above the relegation cutoff, including up to EPL finishing positions 13, 11, 5, and 1. Our main results are robust to doing so, and with a bandwidth up to position 13, the relegation effect is statistically significant at the 5% level in the specification with year fixed effects. Online Appendix Table A1 shows that the three aforementioned factors that plausibly correlate with

[4] If we cluster the standard errors at the level of the 25 university-team pairs, then they are more conservative for the estimates of β_1. For column (I), the s.e. becomes 3.306, and the coefficient remains significantly different from zero at the 5% level. For column (II), the s.e. becomes 3.393, and the coefficient is then only significantly different from zero at the 10% level (p-value=0.066). When using wild cluster bootstrap inference for these models (1,000 reps), as recommended in Cameron et al. (2008) for when the number of clusters is small, we find that the estimates of β_1 are significantly different from zero at the 10% level in columns (I) and (II), (p-value=0.050 and p-value=0.058, respectively), and significantly different from zero at the 5% level in column (III) (p-value=0.028).

[5] These results are robust to including two major universities in the estimation samples that are based in locales with EPL teams during the sample period, but which don't have clear name association: University of Northumbria (Newcastle) and University of Sussex (Brighton). In this case, with a quadratic trend controlled for and 5 observations added to the estimation sample, the effect of relegation is marginally smaller, $\widehat{\beta}_1$=-6.272, p-value=0.037.

TABLE 2: Estimated effects of EPL relegation (log points) on year-to-year growth in total undergraduate admissions, 2003-2020

	2-year lagged: Relegated$_{i,t-2}$				1-year lagged: Relegated$_{i,t-1}$		
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Relegated (β_1)	-7.249**	-6.524**	-8.365**	-4.205	-2.373	-1.744	-1.457
	(3.091)	(3.187)	(3.437)	(3.193)	(2.946)	(2.834)	(3.066)
Position (β_2)	1.278	1.065	1.264	0.787	0.895	0.585	0.583
	(0.945)	(1.021)	(1.006)	(1.073)	(0.945)	(0.868)	(0.954)
Bounceback (β_3)			4.457*				
			(2.265)				
Time trend	No	Yes	Yes	No	No	Yes	No
Year FEs	No	No	No	Yes	No	No	Yes
p-value, $H_0 : \beta_1 + \beta_3 = 0$			0.193				
R^2	0.095	0.117	0.164	0.438	0.010	0.071	0.193
N	66	66	66	66	71	71	71

Notes.- ***,**,* indicate significance from zero at 1%, 5% and 10% levels, respectively, two-sided tests. Robust standard errors are in parentheses. See footnote 4 for details on inference using standard errors robust to clusters at the team-university using the sandwich estimator or wild bootstrap.
Columns (I)-(IV) show estimates of Equation (1) with no time trend, a quadratic time trend, adding an effect for the 10 teams that bounced straight back to the EPL, and fixed effects for each sample year, respectively. The final two columns of Table 1 describe the make-up of the estimation sample.
Columns (V)-(VII) show comparable estimates for the effect of a team's EPL relegation in the previous year on admissions growth the following year for the associated university. In this case, the estimation sample is slightly larger due to using EPL outcomes in 2019 rather than 2001.

a university's admissions growth in our sample period, namely distance from London, population of the local town or city, and global QS rankings, are not significantly affected by relegation, when introduced as dependent variables in the RDD.

5 Conclusion

We have found evidence that the sharp but drastic cutoff facing some teams each year in the EPL, between relegation and survival, affects the admissions prospects of the local universities that are associated by name. This perhaps explains why UK universities close to three ex-Premier League teams have visibly aligned with their local football teams; Reading Football Club featured the 'climate stripes' pioneered by the University of Reading's Meteorology Department, Portsmouth Football Club have been sponsored by the University of Portsmouth since 2020, and the University of Bolton in 2018 purchased the naming rights to the stadium of Bolton Wanderers.[6] It has been reported that some universities make great efforts to link their brands with their prominent football teams, such as

[6]"Show your stripes and share our hoops for the future", www.readingfc.co.uk/..., "University of Portsmouth renews sponsorship deal Portsmouth Football Club in bid to raise aspirations of city children", www.portsmouth.co.uk..., and "Welcome to the University of Bolton Stadium", www.bwfc.co.uk/news/.... Notably since 2023, Bolton Wanderer's stadium has been renamed the Toughsheet Community Stadium, with local fans preferring the previous name and link with the local university: "Hate the name? That's Toughsheet!" https://www.dailymail.co.uk/sport/football/article-11771179/....

the two main Manchester teams, and also Bayern Munich in Germany, even accompanying them on pre-season tours in south-east Asia.[7] Others stress links with EPL teams in their marketing materials.[8]

Our findings contribute to a wider literature suggesting that universities can leverage their association with prominent sporting success. But they also imply that universities can be somewhat beholden to that success or lack thereof. However, we have only been able to study admissions numbers, rather than their quality. There is evidence that the latter is positively influenced by collegiate athletic programmes at North American universities (e.g., Caudill et al., 2018). With access to finer admissions data, this could be investigated for the UK, since the quality of students enters into national and global rankings, which may in turn affect future admissions. Our study was constrained in statistical power due to the relatively small number of universities linked by name to only one EPL team over the past two decades, with Manchester and London being obvious omissions from the study, as well as popular university locales that have not featured in the Premier League, such as Bristol and Oxford. This lack of power may account for why we found no significant effects specifically on non-UK student admissions, despite the anecdotes mentioned earlier which point that way.

Future research could look to build on our findings and explore underlying mechanisms, by collecting richer data on applications and admissions to UK universities. It would be interesting to further investigate the heterogeneity of any effects, for instance concerning student demographics, including gender and socio-economic background. In general, it remains an open question as to the magnitude of externalities on local communities, positive and negative, caused by major professional sports leagues. This is perhaps especially salient where those leagues generate huge global interest and demand but the member teams are also intrinsic to the daily lives of local people. This research question has become pressing in the UK, with regards to the EPL and the rest of the football pyramid, as both major political parties have supported legislation, introduced to Parliament in 2024, to establish a new Independent Football Regulator (IFR) for English men's elite football, "to safeguard the traditional features of English football that matter most to the fans and local communities of clubs."[9]

[7] "Leicester universities' global goals after football triumph", https://www.bbc.co.uk/news/business-36248794.

[8] For instance, Bournemouth University have demonstrated that some students chose to go to university in Bournemouth because of their recent EPL team: "BU students benefit from AFC Bournemouth partnership", https://www.bournemouth.ac.uk/news/....

[9] See a UK Government factsheet on the legislation: https://www.gov.uk/government/publications/football-governance... (accessed 31/5/2024). This was not enacted due to the dissolution of Parliament for the 2024 UK general election, but the major parties are expected to include reintroducing the Football Governance Bill in their manifestos.

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Online Appendix

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Appendix A. Additional Figures & Tables

TABLE A1: Estimated effects of EPL relegation (log points) on year-to-year growth in university undergraduate admissions, 2003-2020: non-UK students

	Non-UK				Non-UK, non-EU			
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIIII)
Relegated (β_1)	-5.362	-2.967	-5.027	-2.041	-8.459	-6.228	-9.006	-6.188
	(6.255	(6.421)	(6.498)	(6.409)	(8.006)	(8.314)	(8.596)	(8.663)
Position (β_2)	2.079	0.974	1.197	0.869	2.785	1.833	2.133	1.827
	(2.160)	(2.473)	(2.432)	(2.431)	(2.586)	(3.044)	(3.008)	(3.073)
Bounceback (β_3)			4.983				6.723	
			(4.911)				5.339	
p-value, $H_0 : \beta_1 + \beta_3 = 0$				0.995			0.798	
Time trend	No	Yes	Yes	No	No	Yes	Yes	No
Year FEs	No	No	No	Yes	No	No	No	Yes
R^2	0.017	0.094	0.108	0.287	0.019	0.059	0.076	0.262
N	66	66	66	66	66	66	66	66

Notes.- ***,**,* indicate significance from zero at 1%, 5% and 10% levels, respectively, two-sided tests. Robust standard errors are in parentheses.
Columns (I)-(IV) and (V)-(VIII) show estimates of Equation (1), comparable to Columns (I)-(IV) of Table 2, with the dependent variable being log changes in undergraduate admissions for, respectively: (i) all non-UK; and (ii) non-UK and non-EU.

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TABLE A2: Estimated effects of EPL relegation (log points) on year-to-year growth in total undergraduate admissions, 2003-2020: team-level results, summing admissions across universities associated by name

	(I)	(II)	(III)	(IV)
Relegated (β_1)	-8.985**	-8.566**	-10.610**	-4.986
	(3.475)	(3.670)	(4.037)	(3.709)
Position (β_2)	1.889	1.781	2.037	1.200
	(1.036)	(1.144)	(1.150)	(1.164)
Bounceback (β_3)			4.877*	
			(2.813)	
Time trend	No	Yes	Yes	No
Year FEs	No	No	No	Yes
p-value, $H_0 : \beta_1 + \beta_3 = 0$			0.096	
R^2	0.116	0.191	0.164	0.507
N	56	56	56	56

Notes.- ***,**,* indicate significance from zero at 1%, 5% and 10% levels, respectively, two-sided tests. Robust standard errors are in parentheses.
Columns (I)-(IV) show estimates of Equation (1), comparable to Columns (I)-(IV) of Table 2, with the dependent variable being log changes in total combined undergraduate admissions for the universities associated by name with the football team (e.g., admissions for Birmingham City University and University of Birmingham are summed together, before we take logs and first differences).

TABLE A3: Estimated effects of EPL relegation (log points) on year-to-year growth in university undergraduate admissions, 2003-2020: increasing the bandwidth

	15-20		13-20		11-20		5-20		1-20	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
Relegated (β_1)	-6.524**	-4.205	-7.018***	-4.464**	-4.443**	-2.504	-3.149*	-2.596	-3.173*	-2.608*
	(3.187)	(3.193)	(2.446)	(2.156)	(2.139)	(1.945)	(1.716)	(1.611)	(1.633)	(1.514)
Position (β_2)	1.065	0.787	1.305	0.942	0.515	0.183	0.127	0.055	0.128	0.059
	(1.021)	(1.073)	(0.540)	(0.469)	(0.359)	(0.326)	(0.145)	(0.141)	(0.118)	(0.112)
Time trend	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Year FEs	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
R^2	0.117	0.438	0.150	0.517	0.088	0.403	0.054	0.297	0.056	0.298
N	66	66	84	84	100	100	145	145	151	151

Notes.- ***,**,* indicate significance from zero at 1%, 5% and 10% levels, respectively, two-sided tests. Robust standard errors are in parentheses.
Columns (I)-(II) repeat the main results from Columns (II)-(III) of Table 2. Columns (III)-(IV), (V)-(VI), (VII)-(VIII), and (IX)-(X) show comparable results when the bandwidth above the relegation cutoff is increased to include EPL finishing positions as high as 13, 11, 5, and 1, respectively.

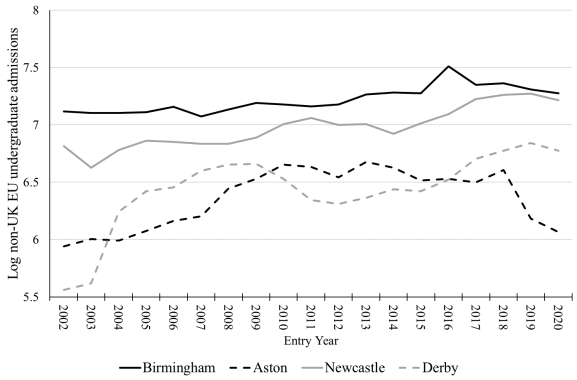
TABLE A4: Estimated effects of EPL relegation (log points) on distance of the university to London, population of the city/town according to UK Census 2011, and average Global QS ranking of the university in 2017-2022

	Dist. to London (10s miles)		Pop. in 2011 (10,000s)		Global QS rank (100s)	
	(I)	(II)	(III)	(IV)	(V)	(VI)
Relegated (β_1)	-1.024	-0.907	2.189	-0.282	-2.074	-3.088
	(3.149	(3.355)	(4.542)	(4.480)	(1.989)	(2.253)
Position (β_2)	-0.383	-0.061	-1.781	-1.102	0.462	0.291
	(0.911)	(1.008)	(1.339)	(1.598)	(0.652)	(0.656)
Time trend	Yes	No	Yes	No	Yes	No
Year FEs	No	Yes	No	Yes	No	Yes
R^2	0.039	0.284	0.116	0.350	0.088	0.275
N	66	66	66	66	66	66

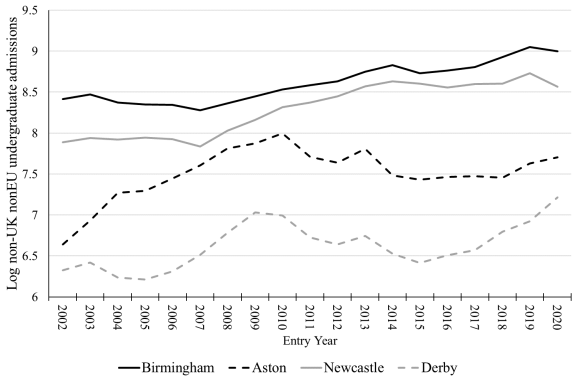
Notes.- ***,**,* indicate significance from zero at 1%, 5% and 10% levels, respectively, two-sided tests. Robust standard errors are in parentheses.
Each pair of columns estimates the regression models from (II)-(III) of Table 2, replacing the dependent variable with the possible confounders given by the column headings.

FIGURE A1: Undergraduate admissions by entry year for selected universities: non-UK students

(a) Non-UK, EU



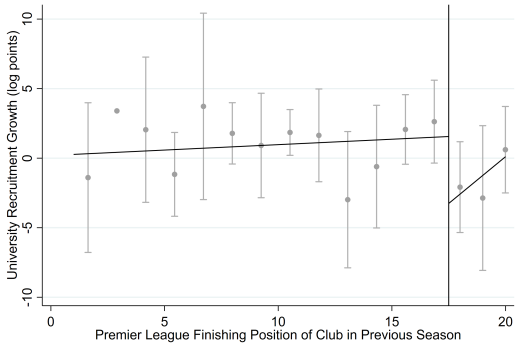
(b) Non-UK, Non-EU



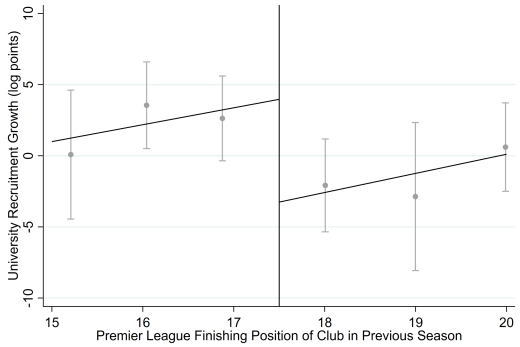
Notes: author calculations using data collected from Higher Education Statistics Agency; www.hesa.ac.uk. Natural logarithm of raw numbers for University of Birmingham, Aston University, University of Newcastle, and University of Derby.

FIGURE A2: Sample averages of year-to-year log change in total undergraduate admissions, 2003-2020, according to the finishing position of the associated EPL team

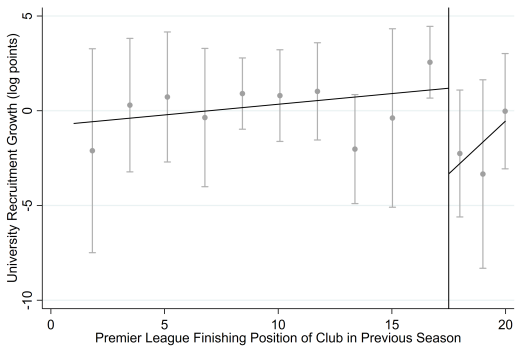
(a) Positions 1-20, raw



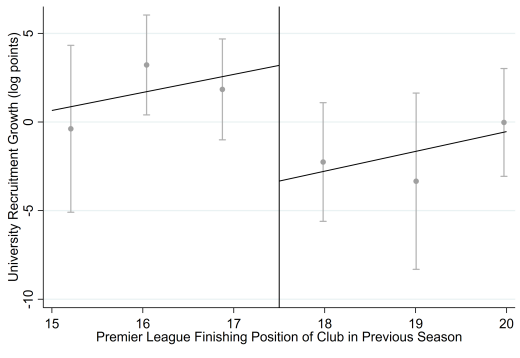
(b) Positions 15-20, raw



(c) Positions 1-20, de-trended



(d) Positions 15-20, de-trended



Notes: author calculations using data collected from hesa.ac.uk and worldfootball.net. Plots obtained using the Stata package *rdplot*, showing 90% confidence intervals for the sample means at each finishing position and line of best fit either side of the relegation cutoff. The change in admissions between t and $t-1$ is compared with finishing position of teams in $t-2$ (see Figure 1). (a) and (b) use raw year-to-year log changes in admissions. (c) and (d) use the residuals from regressing all the raw year-to-year log changes in the full sample (see Table 1) on a quadratic time trend.