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Regional effects of professional sports franchises: causal evidence from four European football leagues

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Appendix A

Table A.1: Final league table and transformation procedure for the Premier League in the season 1996/1997

Rank	Club	NUTS 3 code	Points – Final Table	Difference in Points to First Non-Relegation Rank (X)	Treatment Status	Fixed Relegation Ranks	Outcome
1	Manchester United	UKD31	75	34	0	0	Change of the regional outcomes between 1996 and 1998 / Change of the club level outcomes between season 1996/97 and 1997/98
2	Newcastle United	UKD72	68	27	0	0	
3	FC Arsenal	UKC22	68	27	0	0	
4	FC Liverpool	UKI43	68	27	0	0	
5	Aston Villa	UKG31	61	20	0	0	
6	FC Chelsea	UKI33	59	18	0	0	
7	Sheffield Wednesday	UKE32	57	16	0	0	
8	FC Wimbledon	UKI63	56	15	0	0	
9	Leicester City	UKF21	47	6	0	0	
10	Tottenham Hotspur	UKE42	46	5	0	0	
11	Leeds United	UKF11	46	5	0	0	
12	Derby County	UKI43	46	5	0	0	
13	Blackburn Rovers	UKD41	42	1	0	0	
14	West Ham United	UKI41	42	1	0	0	
15	FC Everton	UKD72	42	1	0	0	
16	FC Southampton	UKJ11	41	0	0	0	
17	Coventry City	UKG33	41	0	0	0	
18	AFC Sunderland	UKC23	40	-1	1	1	
19	FC Middlesbrough	UKC12	39	-2	1	1	
20	Nottingham Forest	UKF14	34	-7	1	1	

Source: Authors own illustration. Data are taken from <http://www.european-football-statistics.co.uk/>.

Appendix B

Robustness analysis

In the robustness analysis, I perform some data manipulations to ensure that certain outliers do not bias the results. I address this issue in three different ways. In the first specification, I remove the 1% smallest and 1% largest observations of the respective outcomes under analysis to exclude extreme growth events from the sample. In the second specification, I drop the upper 25% of the largest regions from the analysis. In this way, I follow the assumption that the effect of relegation should decrease with regional size and that effect size should respond positively to the presence of the relegation of clubs in smaller regions with a small-scale football-related economy. In a last step, I address the issue of potentially confounding major events. Feddersen and Maenning (2012) demonstrate that large sporting events such as the FIFA World Cup exert a positive effect on some of the outcomes under analysis. As these events are likely to rely on stadium capacity or may be located in the same regions as the top division football clubs, this may produce biased results with respect to the presence of these events at the same time in the same region. In order to address this issue, I drop all NUTS3 regions that were hosts of large sporting events, including the UEFA European Football Championship in the UK in the years 1995 and 1996 and the FIFA World Cup in France (in the years 1997 and 1998) and Germany (in 2005 to 2006).

Table B.1: Robustness analysis – regional, sectoral dimension

	Growth of regional sectoral employment (NUTS 3)				Growth of regional sectoral gross value added (NUTS 3)			
	Basic Specifi- cation	w/o outliers	w/o large regions	w/o WC / EC regions	Basic Specifi- cation	w/o outliers	w/o large regions	w/o WC / EC regions
Relegation	-0.027**	-0.022*	-0.025*	-0.026*	-0.030**	-0.029**	-0.036**	-0.022*
	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.012)	(0.015)	(0.013)
N	1202	1177	902	1141	1202	1183	902	1141
Number of obs (l r)	180 1022	176 1001	156 746	175 966	180 1022	177 1008	156 746	175 966
Eff. Number of obs (l r)	95 374	91 365	85 322	91 360	83 328	82 325	63 241	91 360
Order loc. poly. (p) (l r)	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
BW loc. poly. (h) (l r)	6.3 6.3	6.6 6.6	6.8 6.8	6.4 6.4	5.1 5.1	5.7 5.7	4.7 4.7	6.1 6.1
BW bias (b) (l r)	11.2 11.2	10.7 10.7	11.7 11.7	11.2 11.2	9.1 9.1	10.2 10.2	8.5 8.5	10.4 10.4
rho (h/b) (l r)	0.6 0.6	0.6 0.6	0.6 0.6	0.6 0.6	0.6 0.6	0.6 0.6	0.6 0.6	0.6 0.6

Outcome: Mean growth of overall/sectoral regional employment and gva between t-1 and t+1, t = year of relegation.

Notes: Standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01.

Source: Authors own calculation.

Table B.1 presents the results of the regional-sectoral robustness analysis. All specifications indicate that the findings are robust to the exclusion of several types of outliers as well as potentially confounding effects of other large sporting events. With respect to the growth of regional sectoral GVA, the effect becomes larger in smaller regions (-3.6 percent), highlighting the relevance of these events for smaller scale regions. However, regional employment growth does not respond in a similar manner but rather remains at levels similar to the basic specifications (-2.5 percent). Furthermore, these some sensitivity is given to the inclusion of World Cup and European Cup cities. This holds true especially for the regional sectoral GVA dynamics of cities that play host to large sporting events.

Table B.2 illustrates the results for the overall regional effects. Three of the specifications show small but significant effects of relegation on overall regional employment. If I approach overall regional effects without large regions or host cities of World or European Cups, the effect of relegation on overall regional employment or gross value added dynamics remains significant across the specifications. The contrary holds for the growth of overall regional GVA. Here, all specifications show no response in short-term regional development after relegation of a club in the region.

Table B.2: Robustness analysis – overall regional dimension

	Growth of overall regional employment (NUTS 3)				Growth of overall regional gross value added (NUTS 3)			
	Basic Specifi- cation	w/o outliers	w/o large regions	w/o WC / EC regions	Basic Specifi- cation	w/o outliers	w/o large regions	w/o WC / EC regions
Relegation	-0.013*	-0.008	-0.011*	-0.012*	-0.006	-0.006	-0.008	-0.005
	(0.007)	(0.007)	(0.006)	(0.007)	(0.009)	(0.009)	(0.010)	(0.010)
N	1202	1136	902	1141	1202	1175	902	1141
Number of obs (l r)	180 1022	174 962	156 746	175 966	180 1022	177 998	156 746	175 966
Eff. Number of obs (l r)	107 400	81 303	94 343	102 383	107 400	118 421	85 322	102 383
Order loc. poly. (p) (l r)	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
BW loc. poly. (h) (l r)	7.1 7.1	5.6 5.6	7.6 7.6	7.3 7.3	7.5 7.5	8.1 8.1	6.4 6.4	7.0 7.0
BW bias (b) (l r)	13.8 13.8	9.6 9.6	14.7 14.7	14.7 14.7	13.0 13.0	14.6 14.6	11.5 11.5	11.6 11.6
rho (h/b) (l r)	0.5 0.5	0.6 0.6	0.5 0.5	0.5 0.5	0.6 0.6	0.6 0.6	0.6 0.6	0.6 0.6

Outcome: Mean growth of overall/sectoral regional employment and gva between t-1 and t+1, t = year of relegation.

Notes: Standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01.

Source: Authors own calculation.

In the last step, table B.3 reports estimation results with additional covariates. The set of covariates includes country fixed effects to account for potential heterogeneity of the treatment effects across countries in the sample. In addition, I include the overall regional population to account for potential moderating effects of regional size and the initial level of the respective outcome of analysis in t-1 before relegation. The results reveal that the inclusion of covariates does not alter the results. In the case of employment effects, the coefficients increase slightly with higher levels of significance. The opposite holds for the GVA. Here, the effect becomes somewhat smaller with slightly decreasing levels of significance.

Table B.3: Robustness analysis – adding covariates

	Growth of sectoral regional employment (NUTS 3)		Growth of overall regional employment (NUTS 3)		Growth of sectoral regional GVA (NUTS 3)		Growth of total regional GVA (NUTS 3)	
	Basic Specification	With Covariates	Basic Specification	With Covariates	Basic Specification	With Covariates	Basic Specification	With Covariates
Relegation	-0.027**	-0.028**	-0.013*	-0.015**	-0.030**	-0.026*	-0.006	-0.004
	(0.013)	(0.013)	(0.007)	(0.007)	(0.014)	(0.014)	(0.009)	(0.009)
N	1202	1202	1202	1202	1202	1202	1202	1202
Number of obs (l r)	180 1022	180 1022	180 1022	180 1022	180 1022	180 1022	180 1022	180 1022
Eff. Number of obs (l r)	95 374	95 374	107 400	95 374	83 328	83 328	107 400	95 374
Order loc. poly. (p) (l r)	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
BW loc. poly. (h) (l r)	6.3 6.3	6.5 6.5	7.1 7.1	6.6 6.6	5.1 5.1	5.3 5.3	7.5 7.5	6.4 6.4
BW bias (b) (l r)	11.2 11.2	11.7 11.7	13.8 13.8	12.5 12.5	9.1 9.1	9.3 9.3	13.0 13.0	11.2 11.2
rho (h/b) (l r)	0.6 0.6	0.6 0.6	0.5 0.5	0.5 0.5	0.6 0.6	0.6 0.6	0.6 0.6	0.6 0.6
Covariates		Yes		Yes		Yes		Yes

Outcome: Mean growth of overall/sectoral regional employment and gva between t-1 and t+1, t = year of relegation.

Notes: Standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01.

Source: Authors own calculation.