Common International Trends in Football Stadium Attendance

Jan van Ours[1]

[1] Erasmus University Rotterdam, Tinbergen Institute

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Jan C. van Ours[*]

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Abstract

This paper examines long-term developments in stadium attendance in professional football in the Netherlands. As in many other European countries attendance had a U-shaped development with the lowest numbers in the mid-1980s. The developments in the Netherlands do not seem to have been affected by hooliganism but by socioeconomic factors and developments in recreation. Furthermore, the association with stadium attendance in the English Premier League is very high. This suggests that stadium attendance is affected not only by national developments but also by common international trends in the interest in football matches.

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[*]Erasmus School of Economics, Erasmus University Rotterdam, Erasmus Center of Applied Sports Economics (ECASE) and Tinbergen Institute (Rotterdam), The Netherlands; Department of Economics, University of Melbourne, (Parkville) Australia and CEPR (London) U.K.; vanours@ese.eur.nl.

1 Introduction

For many supporters, football is like a religion. During the season, they usually meet once a week alternating between the home stadium and an away stadium. Songs are sung, joy and happiness are shared in case of a win, sadness and disappointment are internalized in the companionship of fellow supporters. For many supporters, being at a match of their favorite team is like sitting in a roller-coaster of emotions. The days after a loss are depressing, the days after a win happiness is boasted, they are full of satisfaction about their favorite team, football as a sport and sometimes about life in general. For some supporters, visiting a football stadium is an integral part of their life. Nevertheless, not every football supporter will visit a stadium whatever the costs may be, financially or emotionally. Buying a seasonal ticket or a day ticket to attend a match is like consuming a service offered by a football club. Therefore, stadium attendance is subject to the usual determinants of consumer demand but also to some sport-specific characteristics.

While there is similarity between consumer demand and demand for a stadium seat there are clear differences at the supply side between incentives of regular firms and those of sports clubs. Whereas regular firms may aim for a monopolistic market position to maximum profits for the sports club a monopoly would destroy the business (Neale (1964)). Sports fans are looking for excitement not for boring games where the outcome can be guessed long in advance. Szymanski (2001) for example concludes from a comparison of attendances of Premier League matches and FA Cup matches – in which over time the difference in strength between the two competing teams increased a lot – that a drop in competitive balance reduced stadium attendance.

Borland and MacDonald (2003) provide an extended overview of the determinants of the demand for sports in general and stadium attendance in particular. They mention five main categories of determinants of stadium attendance: Consumer preferences (supporting a club), economic determinants (price, travel costs, income, market size, availability of substitutes, macroeconomic factors), quality of viewing (quality of seating, timing of the contest), characteristics of the sporting

contest (uncertainty of outcome, success of competing teams, quality and significance of the match) and stadium capacity. Some of these determinants relate to stadium attendance of single matches, other determinants are important for seasonal attendance since a lot of attendants are supporters who have seasonal tickets. As to the uncertainty of outcome, there is match uncertainty depending on the strength of the two teams playing and seasonal uncertainty related to end-of-season matches that may determine who wins the league, who is relegated, and so on. Empirical studies on stadium attendance are usually based on match-level data from a limited number of seasons in a single country investigating the relationship with among others the uncertainty of outcome. Besters et al. (2019) for example find that the attendance of individual matches in Dutch professional football is related to loss aversion more than to preference for uncertain outcomes. Furthermore, team quality is important while towards the end of the season, outcome uncertainty with respect to the final ranking becomes important. Apart from determinants related to stadium visits themselves, there is interaction between stadium attendance and viewing matches on television. Buraimo (2008) for example concludes that there is a positive relationship between the two in the sense that crowded stadiums are more attractive to watch on television. Similarly, one can imagine that watching a match on television may stimulate to desire to be present in the stadium.

There are quite a few studies on football stadium attendance for individual football matches taking into account many of the potential determinants just discussed (see Besters et al. (2019), for a recent overview). However, there are not many economic studies that have a long-term perspective on stadium attendance. Dobson and Goddard (1995) is one of the exceptions studying a period of almost 70 years of English football. They find that ticket-prices have a significant but small effect, while success of a club is a major determinant of stadium attendance. A peculiarity of stadium attendance in English football is the dip in the 1980s which Dobson and Goddard (1995) attribute to the economic recession and hooliganism that had its heyday in England. The recovery in attendance started late 1980s when technological developments made television-broadcasting possible through

cable and internet thus attracting attention to the excitement and joy of attending a live football match (Koning (2020)). The interaction between attending a match and watching a match on television is a recent phenomenon i.e. happening in the past decades. It cannot explain the big drop in stadium attendance in the period early 1970s to late 1980s. Whereas for some time broadcasting a match on television was thought to be at the expense of stadium attendance in recent decades there seems to be complementarity rather than substitution. In that sense, the increase in football watching on television may have stimulated stadium attendance.

The current paper presents an analysis of seasonal stadium attendance in Dutch professional football from the start in 1956/57 to 2018/19, the last full season before the Covid-19 crisis forced stadiums to remain empty. The set-up of this paper is as follows. Section 2 provides an international perspective of long term developments in stadium attendance comparing seven football leagues indicating that in the past 60 seasons between some leagues correlation in attendance has been remarkably high. The dip in stadium attendance in the 1980s was a phenomenon that was present in the top tiers of professional football of quite of few other countries. Furthermore, this section describes football stadium attendance in the Netherlands in the past 63 seasons in more detail. Section 3 discusses potential determinants of seasonal stadium attendance distinguishing between club-specific and season specific club-invariant determinants. Club-specific determinants are seasonal performance of the club and stadium capacity. Season-specific determinants that affect clubs across the board are the socioeconomic situation, hooliganism, recreational developments and interest in football. These determinants are represented by unemployment rate, arrests because of football hooliganism, cinema visits as an indicator for recreational developments and stadium attendance in the English Premier League representing international trends in the interest in high-quality football matches. Section 4 presents the empirical analysis which is done in two stages. In the first stage, club-specific stadium attendance is specified in a linear regression with fixed effects for clubs and seasons, seasonal performance indicators and stadium capacity as explanatory variables. In the second stage, the

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seasonal fixed effects from the first stage are related to unemployment rate, cinema visits, attendance in the Premier League and hooliganism. Section 5 concludes that stadium attendance is influenced by club-specific as well as season-specific factors. Over time, unemployment rates and developments in recreational activities have been important but not hooliganism. Furthermore, after taking the club-specific and Dutch season-specific factors into account, there is still a strong association between football stadium attendance in the Netherlands and England suggesting that there are common international trends in the interest in football.

2 Developments in stadium attendance

2.1 International developments

Table 1 provides an overview of international developments in football stadium attendance. Panel a shows five-year averages in attendance in the top leagues for seven European countries. Clearly, over the past five years the German Bundesliga had the highest number of stadium attendants of a little over 43,000 per match. The English Premier League had about 37,000 attendants per match. Spanish La Liga matches attracted about 27,000 attendants. The Italian Serie A had about 23,000, the French Ligue 1 about 22,000 and the Dutch Eredivisie had about 19,000 attendants per match.[1] The Belgium Pro League was by far the smallest league in terms of number of match attendants which was about 11,000 over the last five-year period. From 1960 onward, over time in most but not all countries the number of match attendants went up after a dip in the 1980s. Also, for many but not all countries the average number of match attendants in the early periods is lower than in the last periods. Belgium and Italy are two countries where the numbers at the end are very similar to those in the beginning. In the second half of the 1960s, in Belgium there were on average 10,000 match attendants, in the late 2010s this was a little over 11,000. In Italy, these numbers were 24,700 and

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[1] "Eredivisie" means Honorary division. The second tier of professional football in the Netherlands is called "First division". For some time there was also a third tier called "Second division".

23,200. The difference between the two countries is that in Belgium there is a dip in the early 1990s with less than 8,000 match attendants while in Italy there is a peak in the second half of the 1980s of almost 34,000.

TABLE 1: FOOTBALL STADIUM ATTENDANCE IN THE TOP LEAGUES OF SEVEN COUNTRIES

a. Five-year averages per match (1000)

	Belgium	England	France	Germany	Italy	Netherlands	Spain
1960-64		27.9	8.8			13.2	
1965-69	10.1	29.9	8.0	24.2	24.7	13.5	
1970-74	11.3	30.4	9.0	20.1	31.5	12.4	
1975-79	9.8	28.2	11.1	25.0	32.6	10.6	
1980-84	9.9	22.5	10.3	22.4	32.0	9.1	
1985-89	7.9	20.1	10.6	19.5	33.6	7.1	
1990-94	7.6	21.8	11.9	24.1	31.4	8.7	
1995-99	7.7	28.0	15.4	31.2	30.0	11.8	28.3
2000-04	9.7	33.7	21.5	33.2	27.3	15.4	27.0
2005-09	10.6	34.8	21.5	40.1	22.8	17.9	28.7
2010-14	11.6	35.3	19.8	43.3	23.6	19.5	28.1
2015-19	11.3	37.0	21.9	43.3	23.2	18.9	27.4

b. Pairwise correlations annual seasonal attendances

	Belgium	England	France	Germany	Italy	Netherlands
England	0.72 ***					
France	0.30 **	0.68 ***				
Germany	0.46 ***	0.75 ***	0.87 ***			
Italy	-0.50 ***	-0.68 ***	-0.51 ***	-0.63 ***		
Netherlands	0.70 ***	0.93 ***	0.73 ***	0.81 ***	-0.79 ***	
Spain	0.15	0.13	-0.12	0.30	-0.40 **	0.18

Source: www.european-football-statistics.co.uk/attn.htm

In England, Germany and the Netherlands there is a clear U-shape in the developments. The highest numbers are in the last five-year period, with 37,000 in England, 43,000 in Germany and 19,000 in the Netherlands. The lowest attendances in these three countries are in the second half of the 1980s with about 20,000 in England and Germany and 7,000 in the Netherlands. In France there is a steady increase in the number of match attendants with a small dip in the 1980s. In Spain information about average match attendance is available only since the second half of the 1990s with not much change in later periods.

Panel b of Table 1 shows pairwise correlations in stadium attendance based on

annual data.[2] The correlation is very high between the Netherlands and England (0.93) but also the correlations between England, France and Germany are high. Italy is a clear outlier. There is even a negative correlation between the number of annual match attendants in Italy and all other countries. For Spain, none of the correlations with the exception of Italy are significantly different from zero.

The correlation in attendances in most leagues except for Italy could be caused by common determinants such as socioeconomic developments, developments in hooliganism, interactions between being present in the stadium or watching a match on television. Alternatively, there could be spillover effects in interest to watch a football match in the stadium.

2.2 The Netherlands

Figure 1 shows the developments in the average number of match attendants in the top tier professional football leagues in the Netherlands and England from the mid 1950s to the last complete season with match attendance, i.e. 2018/19. Up to the early 1970s the number of match attendance in the Eredivisie fluctuates around 12,500. Then the numbers start to decline to reach the lowest level of less than 7,000 in the season 1987/88. From the early 1990s there is a steady increase up to almost 20,000 in 2008/09 to decline somewhat in later years. Average stadium attendance in the Premier League shows a very similar pattern, with a drop from an average match attendance of 30,000 in the early 1970s to less than 20,000 in the mid 1980s. After that there is an increase to more than 35,000 in the late 1910s to almost 40,000 in recent years.

Part of the season to season fluctuations are related to shifts in the number of teams competing. For almost all seasons, the Eredivisie had 18 teams (from 1962/63 to 1965/66 there were 16 teams). The top tier division of English professional football, the Premier League, was introduced in 1992/93 as a successor of the

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[2]The number of years available varies from country to country; see also panel a.
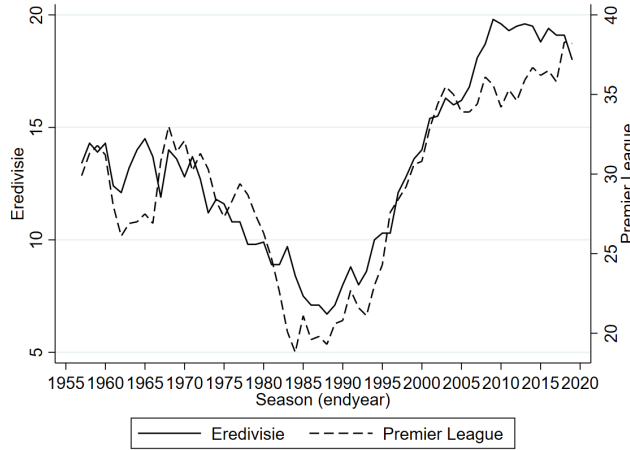
First Division. For most of the seasons in the past decades the top tier had 20
teams (up to 1986/87 and between 1991/92 to 1994/95 there were 22 teams; in
1987/88 there were 21 teams). However, the similarity in the developments over
time suggest that there are common trends at work. Like Dobson and Goddard
(1995), Szymanski and Drut (2020) suggest that the drop in stadium attendance
in the 1980s is related to the world-wide economic recession and hooliganism.

Over the years, in the Netherlands quite a few professional football clubs ceased
to be while other clubs merged into a new club with a different name. Sometimes
a merger of two clubs got the name of one of the clubs. In order situations clubs
changed their name to emphasize the name of the city of residence or introduced
small changes in their name. One of the examples is the name change from Fei-
jenoord to Feyenoord. The pronunciation of the name in Dutch did not change
because of that but from an international point of view the pronunciation became
much easier after the name change. Appendix A provides a detailed overview of
mergers between clubs and name changes whereby in this paper the most recent
name is used. To create a balanced panel two criteria were used: (1) the club
played professional football in all 63 seasons and (2) the club played at least one
season in the Eredivisie. In total 30 clubs fulfilled both criteria. Some summary

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statistics of the teams are shown in Table 2.[3] There are four clubs that were present in the Eredivisie all the time: Ajax, FC Utrecht, Feyenoord and PSV. Helmond Sport was present in the top tier for only two seasons, FC Eindhoven for three seasons. About half of the clubs spent at least one season in the second division. The range in average seasonal stadium attendance per match ranges from the top end with Feyenoord (34,000), Ajax (29,000) and PSV (23,000) to the low end with FC Dordrecht and Helmond Sport who attracted less than 3,000 attendants per match.

TABLE 2: SUMMARY STATISTICS BY CLUB; 1956/57 – 2018/19

	Club	Number of Seasons			Attendance (1000)	Capacity (1000)
		Ere divisie	First division	Second division		
1	ADO Den Haag	45	18	0	9.0	15.7
2	Ajax	63	0	0	28.6	46.8
3	AZ Alkmaar	42	19	2	8.9	13.6
4	De Graafschap	21	34	8	6.5	9.5
5	FC Den Bosch	15	45	3	4.4	9.3
6	FC Dordrecht	6	53	4	2.7	5.4
7	FC Eindhoven	3	58	2	3.3	6.1
8	FC Groningen	52	11	0	12.6	17.4
9	FC Twente	61	2	0	13.1	19.8
10	FC Utrecht	63	0	0	12.3	20.2
11	FC Volendam	25	38	0	4.5	9.2
12	Feyenoord	63	0	0	34.0	53.3
13	Fortuna Sittard	32	31	0	5.9	12.9
14	Go Ahead Eagles	31	29	3	6.7	12.0
15	Helmond Sport	2	54	7	2.8	5.2
16	Heracles Almelo	19	42	2	5.3	8.3
17	MVV Maastricht	36	27	0	6.2	12.5
18	NAC Breda	50	13	0	10.5	15.4
19	NEC Nijmegen	40	15	8	8.2	15.5
20	PEC Zwolle	19	29	15	5.2	8.5
21	PSV	63	0	0	23.0	27.4
22	Roda JC Kerkrade	50	5	8	8.7	15.1
23	SBV Excelsior	22	37	4	3.2	7.0
24	SBV Vitesse	34	25	4	10.5	15.8
25	SC Cambuur	7	52	4	5.6	9.3
26	sc Heerenveen	27	24	12	10.3	13.4
27	Sparta Rotterdam	53	10	0	8.9	17.9
28	Telstar	14	48	1	3.4	7.5
29	VVV-Venlo	22	37	4	5.1	9.0
30	Willem II	43	20	0	8.4	13.4
	Average	34	26	3	9.3	15.1

The second division was abolished after season 1970/71.

Capacity is proxied by the highest match attendance in each season.

[3] Appendix B gives a graphical representation of the developments in stadium attendance for each of the 30 clubs.

3 Determinants seasonal stadium attendance

The developments in stadium attendance are partly club-specific and partly driven by general developments, i.e. factors that vary over time but influence all the clubs in a similar way. Table 3 shows descriptives of the variables used in the analysis. Appendix C provides definitions and sources for the variables used in the analysis.

3.1 Club-specific determinants

Over the past decades many clubs have changed the capacity of their stadium, most often by expanding it but sometimes by reducing the capacity for example when standing positions were abolished and attendants had to take a seat. Sometimes clubs renovated their stadium while on other clubs build a new stadium.

Between seasons, stadium capacity may not be exogenous to stadium attendance. If a club is very popular in terms of people attending the stadium the club may decide to expand it stadium. Furthermore, stadium capacity is not a fixed number. Especially in the early years of professional football in the Netherlands capacity could easily be expanded by introducing additional space sometimes as additional places to stand. For example, until December 2005 the Oosterpark stadium – home to FC Groningen – had a formal capacity of 12,500 seats but could be expanded to 20,000 by adding standing places. Clubs could also change stadium if they expected a large crowd. Ajax for example played until season 1995/96 in De Meer with a capacity of 29,500. However, some of their matches were played in the Amsterdam Olympic Stadium which had a capacity of 42,000. To deal with this flexibility issue stadium capacity in a particular season is defined as the maximum number of actual match attendants in that season. As shown in panel a of Table 3 there are 1890 observations (30 clubs – 63 seasons) in which attendance ranged from 661 to 52,987 and stadium capacity from 1200 to 68,000. Of the observations 41% is from the second tier – the first division – and 5% from the third tier – the second division.

Stadium attendance for a club in a particular season may also be affected by

the success of a club in that season. There are various indicators to measure success such as the number of points achieved, the final position in the league table, the goal difference or achieving a championship. Whereas an increase in average stadium capacity may lead to an increase in average stadium attendance this is different for success as the success of one club is always at the expense of other clubs. Table 3 shows that the average number of points at the end of the season ranged from 13 to 101 with an overall average of 49.[4] End-of-season ranking ranges from 1 to 21 with average of 8.9. The end-of-season goal difference ranges from -73 to +90 with an average of +3.

TABLE 3: DATA DESCRIPTIVES; 1956/57 – 2018/19

| Variable	Mean	Minimum	Maximum	Observations
a. Club-specific				
Attendance	9,266	661	52,987	1890
Capacity	15,075	1200	68,000	1890
First division	0.41	0	1	1890
Second division	0.05	0	1	1890
Points/100	0.49	0.13	1.01	1890
Ranking/10	0.89	0.1	2.1	1890
Goal difference/100	0.03	-0.73	0.90	1890
b. Season/year variables				
Unemployment rate	4.8	0.8	10.7	63
Premier League (1000)	29.2	18.8	38.3	63
Arrests	1326	652	2401	27
Cinema visits (mln)	27.9	13.7	69.1	63

3.2 Season-specific determinants

Stadium attendance is likely to be influenced by socioeconomic developments such as the unemployment rate for which an overview is provided in panel a of Figure 2. Clearly, from the early 1970s onward, the unemployment rate increased substantially from less than two percent to more than 10 percent in the middle of the 1980s. After that, unemployment rates went down but with substantial annual fluctua-

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[4]These points are calculated on the basis of the current system where a club gets three points for a win, one point for a draw and zero points for a loss. In reality, until season 1994/95 clubs got two points for a win in stead of three.

tions. Previous studies suggest that hooliganism affected stadium attendance in

FIGURE 2: UNEMPLOYMENT RATE (%), ARRESTS AND CINEMA VISITS; 1956-2018

a. Unemployment rate and arrests

b. Cinema visits (mln)
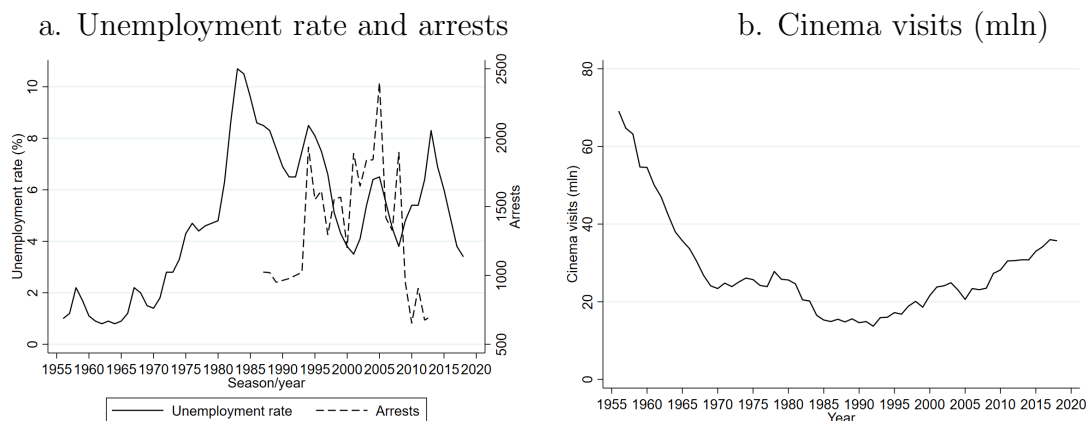
England. Systematically collecting information about football hooliganism in the Netherlands started in 1987. Linckens and Berghuis (1988) analyzed information about football hooligan arrests in 1987 concluding that about 80 percent of the arrests was for violations outside the stadium, 40 percent of the hooligans were minor, i.e. younger than 18 years while about half of the hooligans had been in contact with justice on a previous occasion for issues unrelated to football vandalism. Spaaij (2007) argues that before the 1970s there was little football vandalism in the Netherlands. In the 1980s and 1990s not much changed in terms of the quantity of the vandalism. The event that is considered to be the starting point of football vandalism in the Netherlands is the May 1974 UEFA Cup final match between home team Feyenoord and the London team Tottenham Hotspur. Visiting supporters attacked the home supporters and more than 200 people were injured. The first domestic stadium riot that was televised was in October 1976 and concerned supporters of FC Utrecht and Ajax. November 1983, there was life broadcasting of within-stadium fighting between supporters of (again) Feyenoord and Tottenham Hotspur. Various measures were taken in the course of time to prevent football vandalism in and around stadiums: home and away supporters were physically separated, large numbers of policy officers were present at matches

that were anticipated to be risky, stadiums were transferred into all-seats, i.e. all supporters were supposed to be seated, CCTV (Closed circuit television) was installed, etcetera. This reduced football vandalism within and outside stadiums a lot but the vandalism was shifted to other places such as city centers and train stations. Overall football vandalism was not reduced. Schaap et al. (2015) analyze match level data over the period 2006 to 2011 on hooliganism in the Netherlands in an attempt to evaluate policy measures aiming to reduce football hooliganism. They find that matches played early in the day and in daylight have a smaller probability of hooliganism occurring. They also find that alcohol prohibition within the stadium increases the probability of an incident outside the stadium attributing this to a "waterbed effect". Panel a of Figure 2 confirms that the number of arrests fluctuated a lot with no clear upward or downward pattern.

Another potential determinant of stadium attendance is the recreation of the Dutch population. As an indicator for recreational activities in relation to stadium attendance visits to the cinema are used. After all, both represent outgoing behavior of people consuming a service outside their home, i.e. a movie or a football match. The idea is not that cinema visits had a causal effect on football stadium attendance. Rather cinema visits picked up a trend in outgoing behavior that may have affected stadium attendance as well. Panel b of Figure 2 shows a strong decline in cinema visits probably related to the introduction and later expansion of television broadcasting in the Netherlands. From the mid-1980s onward cinema visits increased reflecting a change in outgoing behavior.

Panel b of Table 3 provides the descriptives for the seasonal data. Over the 63 years the unemployment rate ranges between 0.8 and 10.7 percent of the labor force with an average of 4.8%. Premier League attendance ranged from 18,800 to 38,300 with an average of 29,200. Cinema visits ranged from 13.7 million to 69.1 million with an average annual number of 27.9. The information about arrests is limited to 27 seasons in which the number of arrests ranged from 652 to 2401.

4 Empirical analysis

4.1 Set-up of the analysis

Some determinants of stadium attendance are club-specific, others are common to all clubs but season-specific. Therefore, the estimations are done in two stages. First, a least squares dummy variables regression is done. The dependent variable y_{it} is the log of stadium attendance of club i in season t:

$$y_{it} = \alpha_i + \beta x_{it} + \gamma_t D_t + \varepsilon_{it} \tag{1}$$

where x_{it} is a vector of club-specific time varying explanatory variables, D_t are seasonal dummy variables, and α_i represents club fixed effects.[5] Furthermore, β is a vector of parameters and ε_{it} is an error term. In the second stage, to explain developments over seasons a model is estimated using $\hat{\gamma}_t$ as the dependent variable. The regression model in the second stage is given by

$$\hat{\gamma}_t = \delta z_t + u_t, \tag{2}$$

where z_t is a vector of time-varying explanatory variables.[6] Furthermore, δ is a vector of parameters and u_t is an error term. The parameter estimates in the second step are unbiased and since the number of observations is quite large (63), the standard errors are estimated accurately (Bryan and Jenkins (2016)).

4.2 Parameter estimates

Table 4 shows the parameter estimates for the first stage of the analysis where the log of attendance per club per season is related to the division, performance

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[5]There is no information available about ticket prices. To the extent that these are club-specific they are absorbed in the club fixed effects. To the extent that they have a trend-like development they are absorbed in the time trend which is included in the second stage. Also, ticket prices are only part of the costs of visiting a match. Other costs involved are travel costs and costs of leisure time.

[6]When calendar year are used they refer to the first calendar year in a season, i.e. if the season is 1980/81, the calendar year is 1980.

TABLE 4: PARAMETER ESTIMATES STADIUM ATTENDANCE;
FIRST STAGE - CLUB-SPECIFIC EFFECTS

	1956/57-2018/19		1987/88-2013/14	
	(1)	(2)	(3)	(4)
First division	-0.31***	-0.31***	-0.44***	-0.44***
	(0.03)	(0.03)	(0.05)	(0.05)
Second division	-0.42***	-0.42***		
	(0.07)	(0.07)		
Ranking/100	-0.80***	-0.65***	-0.63	-0.64**
	(0.37)	(0.23)	(0.44)	(0.30)
Goal difference/100	0.29***	0.24***	0.17**	0.18***
	(0.05)	(0.05)	(0.07)	(0.06)
Points/100	-0.13		0.03	
	(0.16)		(0.18)	
Log Stadium Capacity	0.73***	0.73***	0.57***	0.57***
	(0.03)	(0.03)	(0.05)	(0.05)
Observations	1,890	1,890	810	810
R-squared	0.866	0.866	0.869	0.842

Fixed effects for seasons and clubs are included; R-squared is within.
Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.01$

indicators and log stadium capacity. Compared to the Eredivisie, attendance is lower in the first and second division. Of the three performance indicators the number of points in a season is insignificantly different from zero, while ranking and goal difference are both highly significant. Stadium capacity has a significant positive effect on stadium attendance. In the second column seasonal points are removed as explanatory variable, which affects the parameter estimate for ranking somewhat, but leaves the other parameter estimates largely unaffected. Columns (3) and (4) show equivalent estimates over the time period 1987/88 to 2013/14, the time period over which there is information about hooliganism. During this time period the second division no longer existed. Although the parameter estimates are slightly different from those in the first two columns the effects are very much the same. From column (2) of Table 4 it follows that compared to playing in the Eredivisie, in the first division stadium attendance was about 25% lower while playing in the second division reduced the number of attendants with another 10%-points. One place up in the final ranking on average generated close to 1% additional stadium attendance while 1 goal extra generated about 0.2% extra attendance.

TABLE 5: PARAMETER ESTIMATES STADIUM ATTENDANCE;
SECOND STAGE – SEASONAL EFFECTS

	1956/57-2018/19		1987/88-2013/14	
	(1)	(2)	(3)	(4)
Time*10	0.13***	0.09***	0.22***	0.15***
	(0.01)	(0.01)	(0.03)	(0.03)
Log Urate	-0.15***	-0.08***	-0.14***	-0.09***
	(0.02)	(0.02)	(0.04)	(0.03)
Log Cinema Visits	0.24***	0.16***	0.14	0.00
	(0.03)	(0.03)	(0.10)	(0.08)
Log Premier League		0.41***		0.45***
		(0.06)		(0.12)
Log Arrests			0.11***	0.04
			(0.02)	(0.03)
Observations	63	63	27	27
R-squared	0.899	0.941	0.981	0.989

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.01

Table 5 shows the parameters of the second stage regression. The dependent variables are the series of seasonal fixed effects from columns (2) and (4) of Table 4. Column (1) shows that the calendar time developments in stadium attendance are subject to a linear trend, which may represent developments in preferences but could also reflect population growth or the growth of real income. Furthermore, the unemployment rate has a negative effect while cinema attendance is positively associated with stadium attendance. Column (2) shows that in addition to this the development of Premier League attendance has a significant positive parameter estimate. Columns (3) and (4) show what happens if the log of the number of arrests is included as additional variable. Except for cinema visits, the other parameters are not very much affected. The effect of arrests themselves is positive which is probably due to reverse causality, i.e. more arrests are possible with bigger crowds. Clearly, hooliganism did not have a negative effect on stadium attendance.

To investigate the sensitivity of the parameter estimates the log of real per capita income was included in stead of a time trend. Similarly, log population size was introduced in stead of a time trend. This does not affect the main finding of the attendance in the Premier League being significantly associated with attendance

in Dutch professional football.

Appendix D shows parameter estimates for every club separately. Although there are club-specific differences in magnitudes of the relevant parameters, for many clubs the pattern is similar. For almost all clubs that played in more than one division, the number of stadium attendants is substantially lower in a lower division with the same magnitude of about 25% fewer attendants when playing in the first division than the top tier and 35% when playing in the second division compared to the the top tier, the Eredivisie. A notable exception is FC Twente that played 61 seasons in the Eredivisie and attracted about the same stadium crowd in the two seasons they played one division lower. Ranking and goal difference are not significant for every club but stadium capacity always has a significant positive effect. The linear trend is often but not always significantly different from zero. Unemployment rate and Premier League attendance have significant effects on for example the big two – Ajax and Feyenoord – with supporters from all over the country but the big third with a more regional exposure – PSV – has a stadium crowd that was not much affected by developments in unemployment or developments in the Premier League. The opposite is the case for the effect of ranking that is not significant for Ajax and Feyenoord but is significant for PSV. The developments in cinema visits are significant for some clubs but not for others.

An important conclusion from the empirical analysis is that the dip in stadium attendance which materialized in many leagues in the mid-1980s is due to a combination of socioeconomic development and international spillovers. Figure 3 illustrates that for the Netherlands the general pattern in the development of football stadium attendance can be explained to a large extent using a model without Premier League attendance as one of the explanatory variables although the timing of dip is not perfect. Including Premier League attendance as additional explanatory variable improves the fit somewhat in particular with respect to the timing of the dip. Towards the end of the period of analysis the predicted developments are somewhat too optimistic which may be due to the trend effect slowly disappearing.

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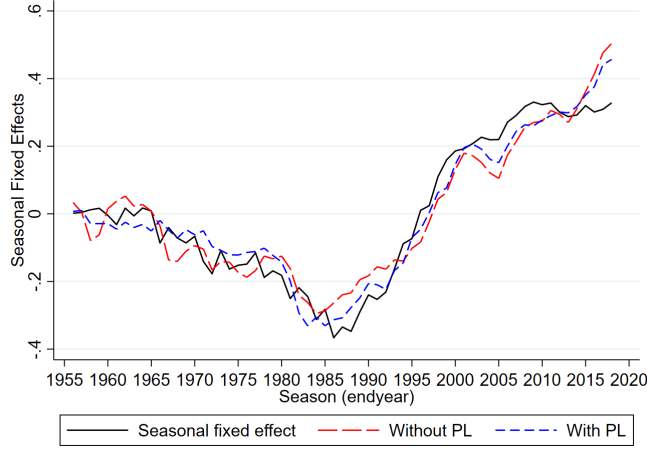
Note: Seasonal fixed effects are from the estimates presented in Table 4 column (2). Without
PL (with PL) are based on the estimates in the first (second) column of Table 5.

5 Conclusions

Professional football attracts a lot of attention from media, television viewers and
supporters who visit stadiums on a regular basis. It is no exception that tens of
thousands of people travel to a stadium to watch their favorite team play for two
times 45 minutes. Since many matches can be watched on television as well it is
surprising that so many football lovers are willing to spend four to six hours of their
life just to watch their team play and spend quite a lot of money too. After all, it
is not just watching the game but also traveling to and from the stadium that is
time consuming. And, it is not just the price of the ticket but also the travel costs
that have to be covered. The phenomenon of massive interest in football stadium
attendance goes back a long time. Fifty to sixty years ago the situation was not
very different. Even in those days with substantially lower incomes, longer travel
times as public transport was for many the only possible way to reach the stadium,
uncomfortable seats in sometimes appalling weather conditions visiting a stadium
was very popular. Looking back at the developments in stadium attendance over
the past 50 to 60 years there is a remarkable dip in the 1980s, a phenomenon that

the Netherlands shared with England, Germany, France, and Belgium.

This paper presents an analysis of long-term developments in professional football stadium attendance in the Netherlands for a balanced panel of 30 clubs over 63 seasons. Stadium attendance appears to be influenced by club-specific factors and season-specific determinants. At the level of the club, stadium attendance is affected by stadium capacity, performance of the club and the league in which they play. Over time, unemployment rates and recreational developments seem to have been important but not hooliganism. In addition to this, there is a strong association between stadium attendance in the Netherlands and other countries in particular England. This suggests that there are unobserved factors influencing both football leagues through international common trends in the interest for professional football.

The future of football stadium attendance is unclear. The current Covid-19 pandemic is responsible for empty stadiums. Football supports who used to share their joy and excitement as well as sadness and disappointment now have to digest all these emotions alone or with a few friends. So sad. It is not clear how quickly football lovers are allowed to return to the stadium. It might be gradually, starting with a low occupancy rate to allow for sufficient social distance between the spectators. However, even a gradual return to the stadium would bring immense joy to the ones who are allowed to watch their favorite team face to face. Viewing a match on television is no doubt more comfortable, time efficient and cheaper than visiting a stadium. Nevertheless, it is not a real substitute for the live event.

References

Besters, L. M., J. C. van Ours, and M. A. van Tuijl (2019). How outcome uncertainty, loss aversion and team quality affect stadium attendance in Dutch professional football. *Journal of Economic Psychology 72*, 117–127.

Borland, J. and R. MacDonald (2003). Demand for sport. *Oxford Review of Economic Policy 19*(4), 478–502.

Bryan, M. L. and S. P. Jenkins (2016). Multilevel modelling of country effects: A cautionary tale. *European Sociological Review 32*(1), 3–22.

Buraimo, B. (2008). Stadium attendance and television audience demand in English League football. *Managerial and Decision Economics 29*(6), 513–523.

Dobson, S. M. and J. A. Goddard (1995). The demand for professional league football in England and Wales. *Journal of the Royal Statistical Society 44*(2), 259–277.

Koning, R. (2020). U kijkt toch ook? ("You do watch, don't you?"). *TPEdigitaal 14*(1), 19–30.

Linckens, P. J. and A. C. Berghuis (1988). *Justitie versus voetbalvandalen (Justice and football-hooligans)*. WOCD, Ministerie van Justitie.

Neale, W. C. (1964). The peculiar economics of professional sports: A contribution to the theory of the firm in sporting competition and in market competition. *Quarterly Journal of Economics 78*(1), 1–14.

Schaap, D., M. Postma, L. Jansen, and J. Tolsma (2015). Combating hooliganism in the Netherlands: An evaulation of measures to combat hooliganism with longitudinal registration data. *European Journal on Criminal Policy and Research 21*(1), 83–97.

Spaaij, R. (2007). Football hooliganism in the Netherlands: Patterns of continuity and change. *Soccer and Society 8*(2/3), 316–334.

Szymanski, S. (2001). Income inequality, competitive balance and the attractiveness of team sports: Some evidence and a natural experiment from English soccer. *Economic Journal 111*, F69–84.

Szymanski, S. and B. Drut (2020). The private benefit of public funding: The FIFA World Cup, UEFA European Championship and attendance at host country league soccer. *Journal of Sports Economics 21*(7), 723–745.

Appendix A: Creating a coherent series of club observations

Over the years, quite a few clubs ceased to be while other clubs merged into a new club with a different name. Sometimes a merger of two clubs got the name of one of the clubs. In order situations, clubs changed their name to emphasize the name of the city of residence or introduced small changes in their name.

A1. Mergers

For the teams that have undergone name changes that were not the result of a merger of two or more teams, the most recent name was used. If a merger occurred at any point between 1956/57 and 2018/19, one team is considered to be the 'predecessor' of the post-fusion club. If the 'predecessor' played in all seasons and at least once in the Eredivisie (either as the original club or as the merger club), their team name was replaced by the name of the post-merger club in all seasons. The other teams that contributed to the mergers are not considered in this analysis. The name changes resulting from football club mergers are listed below (first club is considered to be the predecessor of the merger):

    1962: Rapid JC, Roda Sport: Roda JC Kerkrade
    1963: Stormvogels, VSV: Telstar
    1965: SC Enschede, Enschedese Boys: FC Twente ('65)
    1967: Alkmaar '54, FC Zaanstreek: AZ Alkmaar
    1967: FC Den Bosch, Wilhelmina: FC Den Bosch ('67)
    1968: Fortuna '54, RKSV Sittardia: Fortuna Sittard
    1969: PEC, Zwolsche Boys: PEC Zwolle
    1970: DOS, USV Elinkwijk, Velox: FC Utrecht
    1971: ADO, Holland Sport: ADO Den Haag
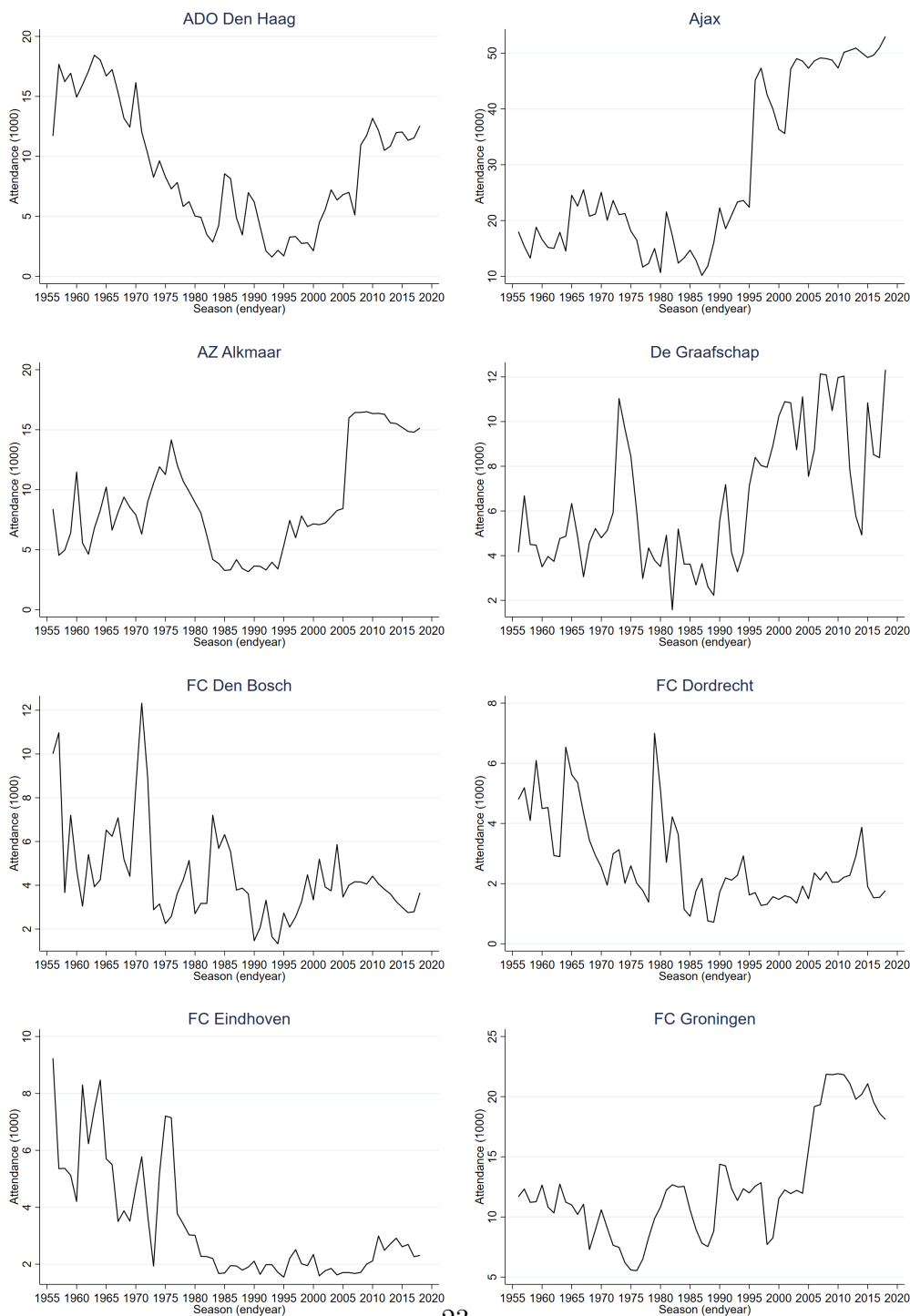   1991: Dordrecht '90, SVV Schiedam: FC Dordrecht

A2. Variety of names

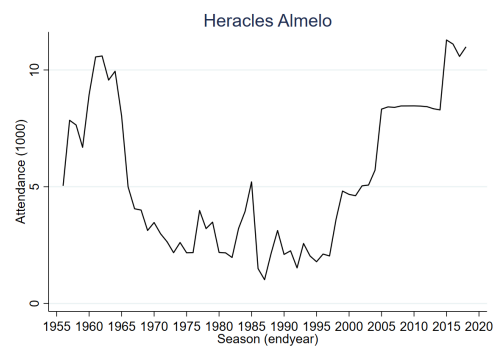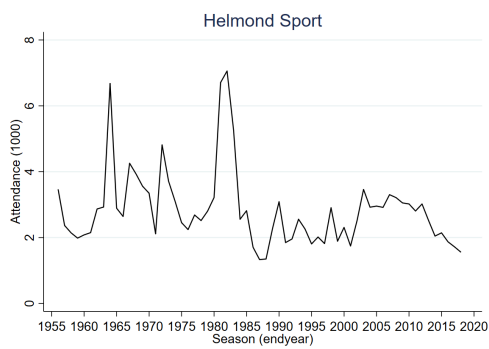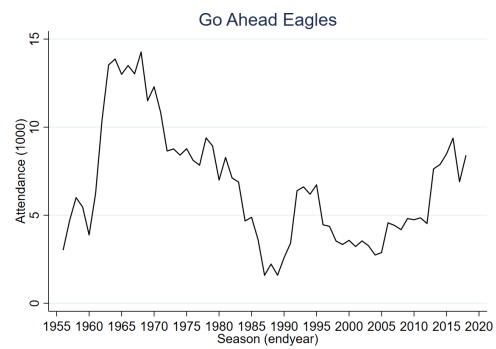The names of most clubs have changed over time. Here is an overview:
    1. ADO Den Haag, ADO, FC Den Haag
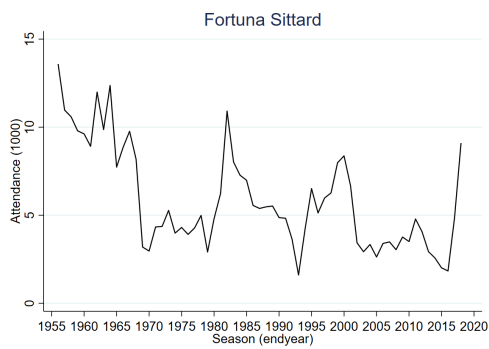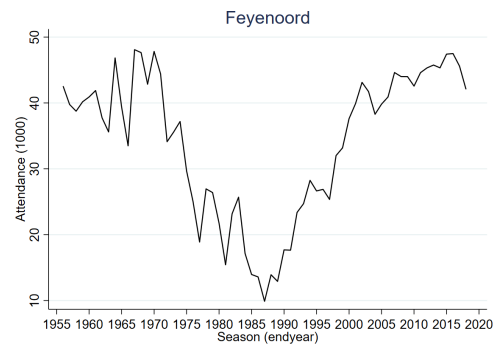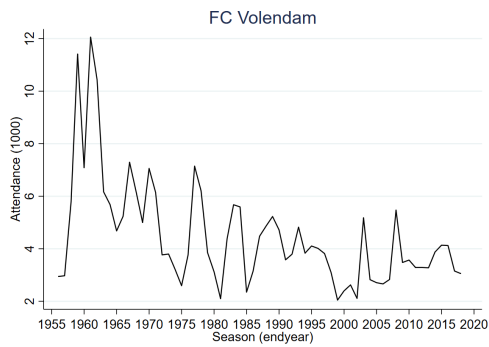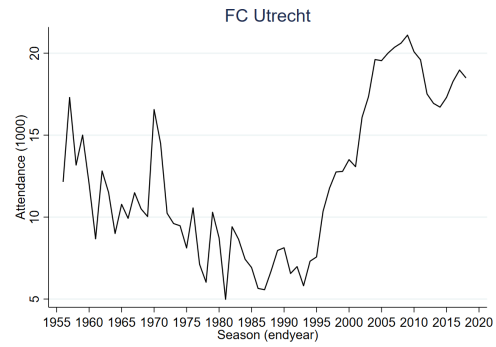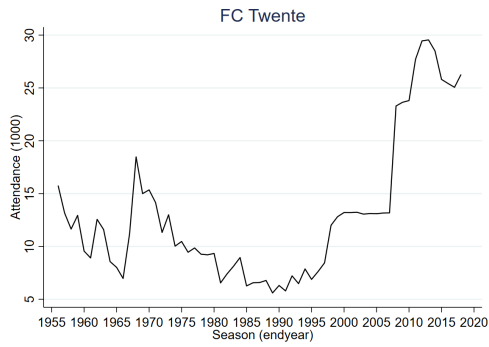   2. Ajax, AFC Ajax, AFC Ajax Amsterdam
    3. AZ Alkmaar, (VV) Alkmaar '54, AZ '67 (Alkmaar), AZ
    4. De Graafschap
    5. FC Den Bosch, BVV (Den Bosch), FC Den Bosch '67
    6. FC Dordrecht, DFC, DS'79, Drechtsteden'79, Dordrecht'90, SVV/Dordrecht'90
    7. FC Eindhoven, (SBV/SC) Eindhoven, EVV
    8. FC Groningen, Groninger VAV, GVAV (Groningen)
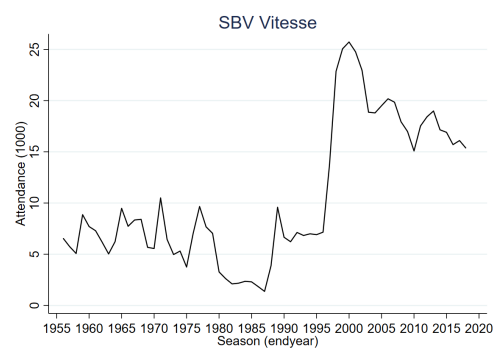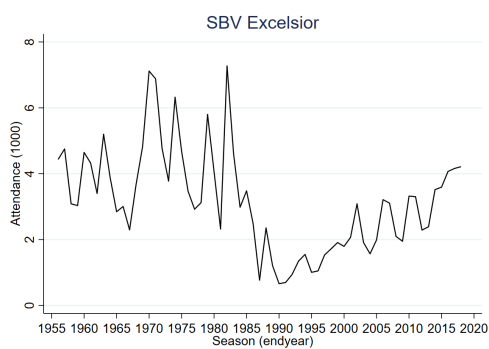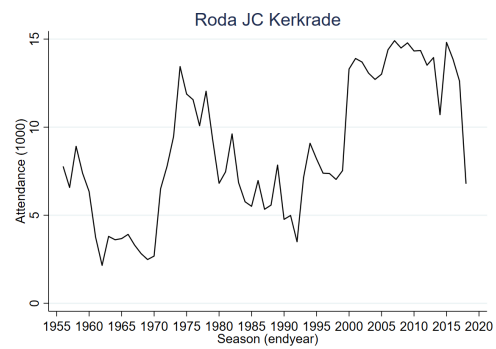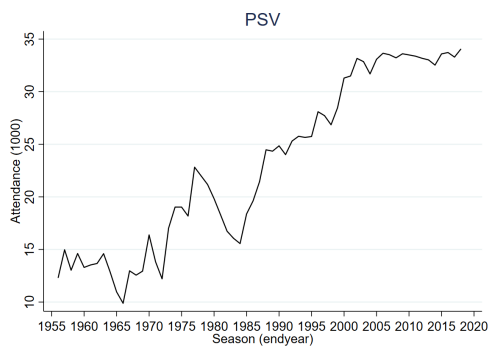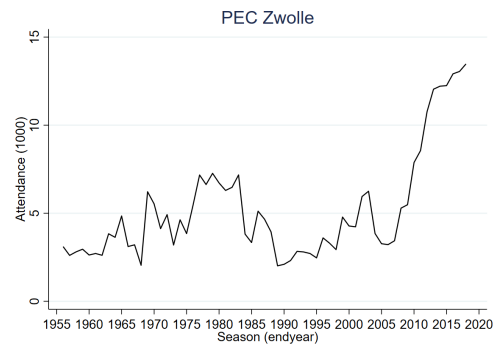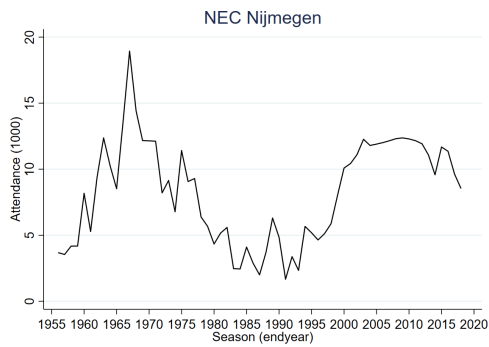   9. FC Twente, SC Enschede, Sportclub Enschede

10. FC Utrecht, VV DOS, DOS Utrecht
11. FC Volendam, Volendam
12. Feyenoord, Feijenoord
13. Fortuna Sittard, Fortuna '54, Fortuna SC, FSC Geleen
14. Go Ahead Eagles, Go Ahead, Go Ahead Eagles Deventer
15. Helmond Sport, Helmondia '55
16. Heracles Almelo, SC Heracles '74
17. MVV Maastricht, MVV
18. NAC Breda, NAC
19. NEC Nijmegen, N.E.C.
20. PEC Zwolle, PEC Zwolle '82, FC Zwolle, PEC
21. PSV
22. Roda JC Kerkrade, Rapid JC Heerlen, Roda JC
23. SBV Excelsior, Excelsior
24. SBV Vitesse, Vitesse
25. SC Cambuur, (Cambuur) Leeuwarden,
26. sc Heerenveen, Heerenveen, SC Heerenveen
27. Sparta Rotterdam
28. Telstar, SC Telstar, IJVV Stormvogels
29. VVV-Venlo,(FC) VVV
30. Willem II, Willem II (1896) Tilburg

Appendix B: Developments in attendance per club

FIGURE 4: STADIUM ATTENDANCE BY CLUB; 1956/57-2018/19 (1000)

MVV Maastricht

NAC Breda

NEC Nijmegen

PEC Zwolle

PSV

Roda JC Kerkrade

SBV Excelsior

SBV Vitesse

SC Cambuur

sc Heerenveen

Sparta Rotterdam

Telstar
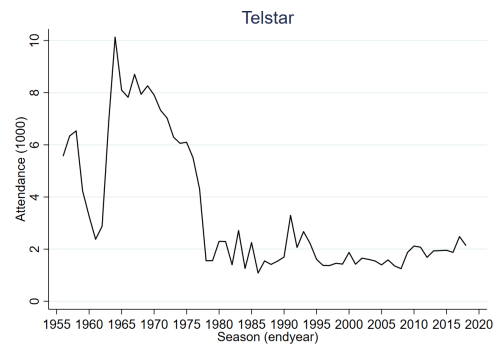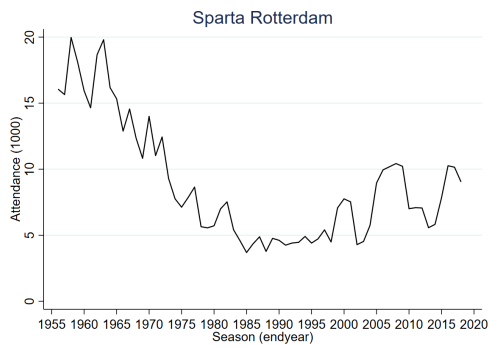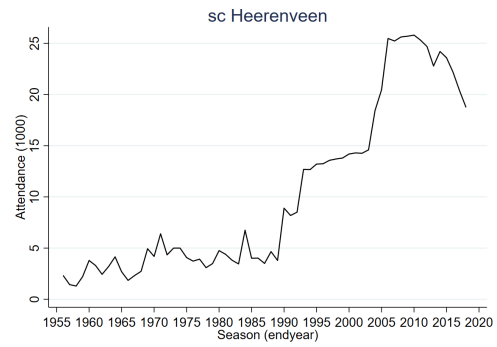

VVV-Venlo

Willem II
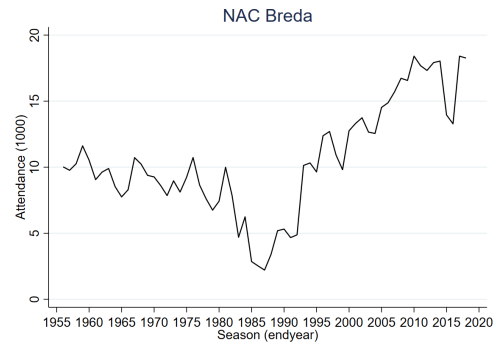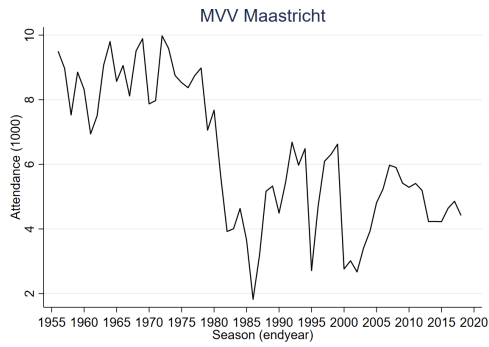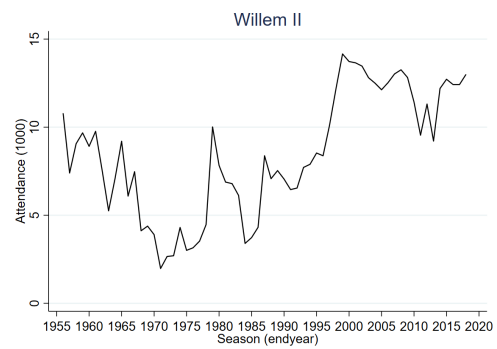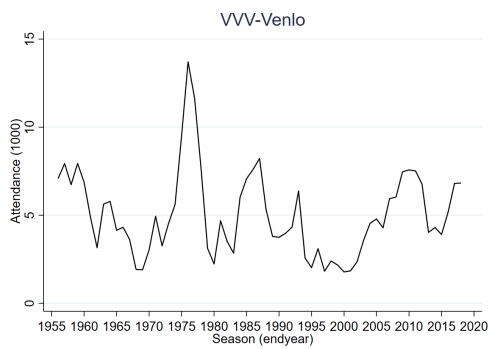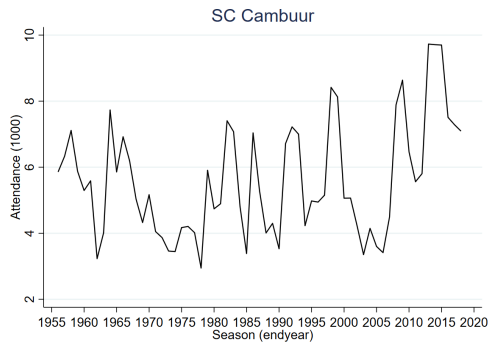
Appendix C: Variables used in the analysis

1. Club-specific variables:

    - Attendance: Average number of attendants per match
    - Capacity: Highest match attendance during the season
    - First Division: Dummy variable if the observation is from a club playing in the First Division
    - Second Division: Dummy variable if the observation is from a club playing in the Second Division
    - Points/100: Number of points end of season divided by 100; 3 points for a win, 1 point for a draw, 0 points for a loss
    - Ranking/100: End of season rank divided by 100
    - Goal difference/100: End of season difference between goal scored and goals conceded

2. Season/year-specific variables:

    - Unemployment rate: Unemployed as a percentage of the labor force
    - Premier League: Average match attendance in the Premier League
    - Arrests: Number of arrests because of football hooliganism
    - Cinema: Cinema visits (mln)

Sources

- Attendance: www.european-football-statistics.co.uk/attn.htm

- Performance:

    - Eredivisie: www.voetbal.com/wedstrijd/ned-eredivisie/
    - First Division: 1956/57 - 1995/96
      nl.wikipedia.org/wiki/Eerste_divisie_(voetbal_Nederland);
      1996/97 - 2018/19 www.voetbal.com/wedstrijd/ned-eerste-divisie/
    - Second Division: nl.wikipedia.org/wiki/Tweede_divisie_(voetbal_Nederland)

- Unemployment rate, population: Statistics Netherlands

- Arrests football hooligans: Centraal Informatiepunt Voetbalvandalisme

- Cinema: boekman.nl/actualiteit/cijfers-in-context/nieuwe-dataset-bioscoopgeschiedenis-in-cijfers

Appendix D: Parameter estimates per club

This appendix gives parameter estimates for every club separately. Although there are club-specific differences in magnitudes of the relevant parameters, for many clubs the pattern is similar.

Variables	ADO Den Haag	Ajax	AZ Alkmaar	De Graafschap	FC Den Bosch	FC Dordrecht
First division	-0.42***		-0.17**	-0.42***	-0.35***	-0.30
	(0.11)		(0.08)	(0.09)	(0.06)	(0.22)
Second division			-0.31	-0.64***	-0.33***	-0.10
			(0.19)	(0.16)	(0.12)	(0.28)
Ranking/100	0.13	0.03	0.05	-0.15	-0.12*	0.03
	(0.11)	(0.21)	(0.11)	(0.10)	(0.07)	(0.14)
Goal difference/100	0.77***	0.15	0.39*	0.01	-0.03	0.64**
	(0.25)	(0.18)	(0.20)	(0.27)	(0.15)	(0.30)
Log capacity	0.54***	0.26**	0.66***	0.57***	0.52***	0.70***
	(0.09)	(0.10)	(0.07)	(0.109)	(0.04)	(0.13)
Linear trend*10	0.11***	0.20***	0.11***	0.10***	-0.02	-0.03
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.04)
Log Urate	-0.17**	-0.17**	-0.17*	-0.19**	-0.06	0.12
	(0.07)	(0.07)	(0.10)	(0.07)	(0.06)	(0.11)
Log Premier League	-0.16	1.15***	0.78***	0.36*	1.04***	0.52*
	(0.19)	(0.26)	(0.25)	(0.19)	(0.16)	(0.28)
Log Cinema	0.59***	-0.06	0.10	0.02	0.02	0.33***
	(0.07)	(0.12)	(0.11)	(0.08)	(0.08)	(0.11)
Observations	63	63	63	63	63	63
R-squared	0.936	0.879	0.919	0.928	0.938	0.869

Variables	FC Eindhoven	FC Groningen	FC Twente	FC Utrecht	FC Volendam	Feyenoord
First division	-0.27**	-0.31**	-0.01		-0.29***	
	(0.11)	(0.12)	(0.14)		(0.10)	
Second division	-0.33**					
	(0.16)					
Ranking/100	-0.21***	-0.05	0.12	-0.08	-0.02	-0.21
	(0.07)	(0.09)	(0.09)	(0.12)	(0.11)	(0.15)
Goal difference/100	-0.10	0.25	0.52**	0.26	0.06	0.13
	(0.18)	(0.22)	(0.25)	(0.25)	(0.24)	(0.24)
Log capacity	0.53***	0.65***	0.67***	0.66***	0.46***	0.44***
	(0.07)	(0.14)	(0.08)	(0.11)	(0.11)	(0.16)
Linear trend*10	-0.01	0.12***	0.11***	0.10***	0.02	0.07**
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
Log Urate	-0.12***	-0.00	-0.01	-0.11	-0.05	-0.17***
	(0.04)	(0.06)	(0.04)	(0.07)	(0.05)	(0.05)
Log Premier League	0.11	-0.05	0.85***	0.95***	0.21	1.14***
	(0.15)	(0.20)	(0.19)	(0.22)	(0.18)	(0.22)
Log Cinema	0.16**	0.36***	0.15	-0.06	0.24*	0.12
	(0.06)	(0.09)	(0.10)	(0.11)	(0.12)	(0.08)
Observations	63	63	63	63	63	63
R-squared	0.959	0.854	0.935	0.866	0.870	0.891

Robust standard errors in parentheses; constants not reported
*** p<0.01, ** p<0.05, * p<0.10

Variables	Fortuna Sittard	Go Ahead Eagles	Helmond Sport	Heracles Almelo	MVV Maastricht	NAC Breda
First division	-0.52***	-0.42***	-0.61***	-0.37***	-0.29***	-0.51***
	(0.09)	(0.09)	(0.12)	(0.10)	(0.08)	(0.07)
Second division		-0.42**	-0.63***	-0.47***		
		(0.17)	(0.13)	(0.14)		
Ranking/100	-0.05	-0.01	-0.18**	-0.17**	-0.05	-0.08
	(0.14)	(0.06)	(0.07)	(0.08)	(0.11)	(0.06)
Goal difference/100	0.22	0.45***	0.19	0.01	0.26	0.41***
	(0.34)	(0.15)	(0.21)	(0.17)	(0.30)	(0.15)
Log capacity	0.49***	0.65***	0.59***	0.61***	0.58***	0.49***
	(0.09)	(0.08)	(0.08)	(0.07)	(0.05)	(0.07)
Linear trend*10	-0.01	0.14***	-0.00	0.04	0.01	0.14***
	(0.03)	(0.02)	(0.02)	(0.04)	(0.02)	(0.02)
Log Urate	0.01	-0.19***	0.03	0.03	0.08	-0.00
	(0.06)	(0.04)	(0.06)	(0.07)	(0.06)	(0.04)
Log Premier League	0.32	0.18	0.32	0.82***	0.58***	0.28
	(0.27)	(0.16)	(0.23)	(0.22)	(0.19)	(0.18)
Log Cinema	0.10	0.28***	-0.02	0.28**	0.09	0.29***
	(0.11)	(0.07)	(0.10)	(0.12)	(0.08)	(0.05)
Observations	63	63	63	63	63	63
R-squared	0.890	0.951	0.864	0.958	0.899	0.954

Variables	NEC Nijmegen	PEC Zwolle	PSV	Roda JC Kerkrade	SBV Excelsior	SBV Vitesse
First division	-0.44***	-0.47***		-0.20**	-0.57***	-0.31***
	(0.11)	(0.09)		(0.09)	(0.09)	(0.11)
Second division	-0.72***	-0.50***		-0.41***	-0.63***	-0.37**
	(0.18)	(0.13)		(0.12)	(0.14)	(0.17)
Ranking/100	0.02	-0.12	-0.19**	-0.11	-0.10	0.03
	(0.13)	(0.10)	(0.08)	(0.10)	(0.11)	(0.15)
Goal difference/100	0.66**	0.28	0.06	0.08	0.20	0.30
	(0.31)	(0.25)	(0.11)	(0.30)	(0.24)	(0.34)
Log capacity	0.46***	0.52***	0.56***	0.71***	0.47***	0.66***
	(0.06)	(0.07)	(0.19)	(0.10)	(0.06)	(0.11)
Linear trend*10	0.10***	0.11***	0.09***	0.08**	-0.01	0.06*
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Log Urate	-0.24***	-0.13*	0.04	0.02	-0.12*	-0.14
	(0.06)	(0.06)	(0.04)	(0.10)	(0.06)	(0.10)
Log Premier League	0.70**	0.19	0.25	0.89***	0.55***	0.95***
	(0.31)	(0.19)	(0.15)	(0.25)	(0.17)	(0.32)
Log Cinema	0.33**	0.24**	0.05	-0.07	0.29***	-0.082
	(0.15)	(0.10)	(0.08)	(0.11)	(0.08)	(0.10)
Observations	63	63	63	63	63	63
R-squared	0.920	0.925	0.917	0.919	0.947	0.951

Robust standard errors in parentheses; constants not reported

*** p<0.01, ** p<0.05, * p<0.10

Variables	SC Cambuur	sc Heerenveen	Sparta Rotterdam	Telstar	VVV Venlo	Willem II
First division	-0.57***	-0.62***	-0.48***	-0.57***	-0.37***	-0.53***
	(0.07)	(0.09)	(0.11)	(0.10)	(0.09)	(0.10)
Second division	-0.87***	-0.80***		-0.92***	-0.61***	
	(0.14)	(0.13)		(0.09)	(0.14)	
Ranking/100	-0.23**	-0.15	0.06	-0.15	-0.19*	-0.11
	(0.09)	(0.10)	(0.10)	(0.10)	(0.11)	(0.07)
Goal difference/100	0.17	0.18	0.38*	0.27	-0.02	0.28
	(0.21)	(0.24)	(0.21)	(0.23)	(0.26)	(0.18)
Log capacity	0.35***	0.50***	0.45***	0.49***	0.65***	0.49***
	(0.07)	(0.08)	(0.09)	(0.06)	(0.08)	(0.13)
Linear trend*10	0.13***	0.14***	0.14***	0.06**	0.01	0.10***
	(0.02)	(0.04)	(0.03)	(0.02)	(0.03)	(0.03)
Log Urate	-0.17***	-0.16**	-0.31***	-0.12***	-0.01	-0.03
	(0.04)	(0.06)	(0.06)	(0.04)	(0.07)	(0.06)
Log Premier League	-0.64***	0.17	0.23	-0.23	0.60**	0.45**
	(0.20)	(0.17)	(0.18)	(0.19)	(0.23)	(0.19)
Log Cinema	0.30***	-0.19**	0.55***	0.37***	-0.09	0.21**
	(0.08)	(0.08)	(0.09)	(0.09)	(0.11)	(0.10)
Observations	63	63	63	63	63	63
R-squared	0.840	0.976	0.926	0.965	0.865	0.934

Robust standard errors in parentheses; constants not reported

*** p<0.01, ** p<0.05, * p<0.10