

Stadium Attendance Demand

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Overview

Quantifying stadium attendance demand

Trends in stadium attendance (a reminder)

Key objectives of football clubs

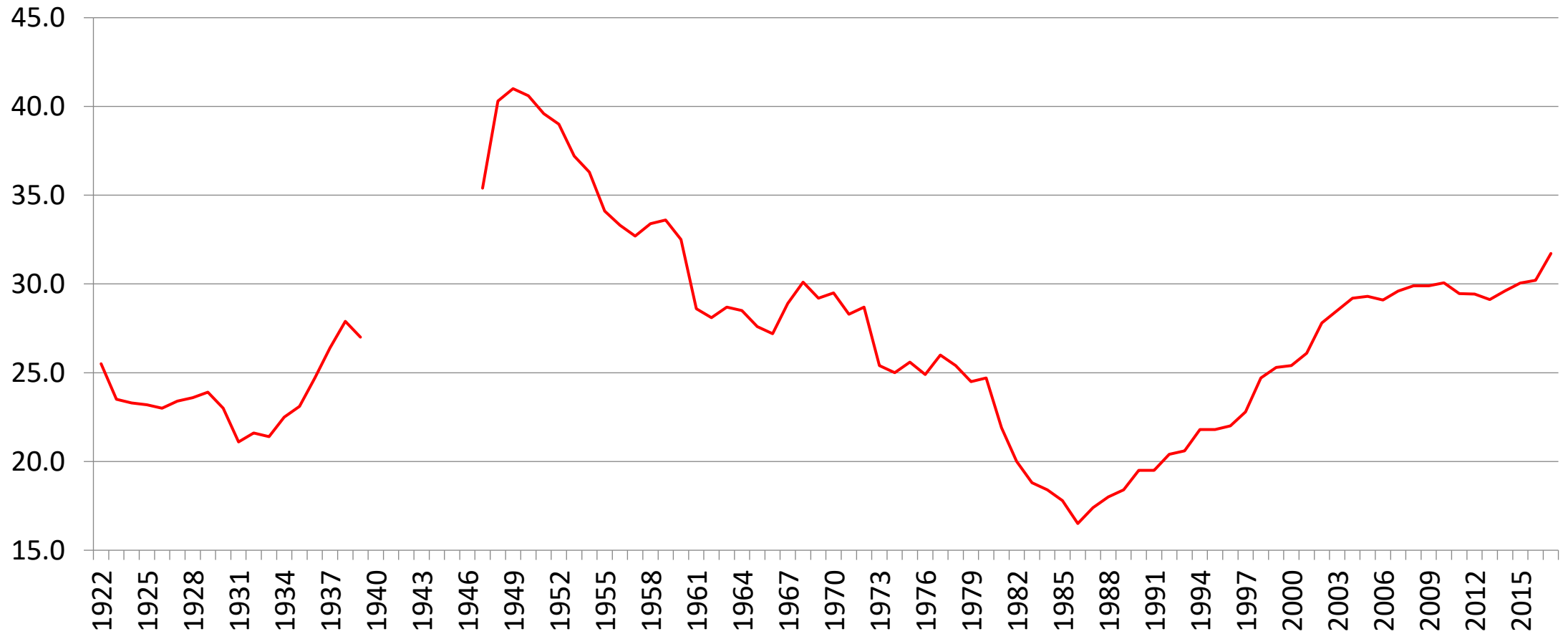
Literature and demand studies of football

Analysing demand using regression analysis

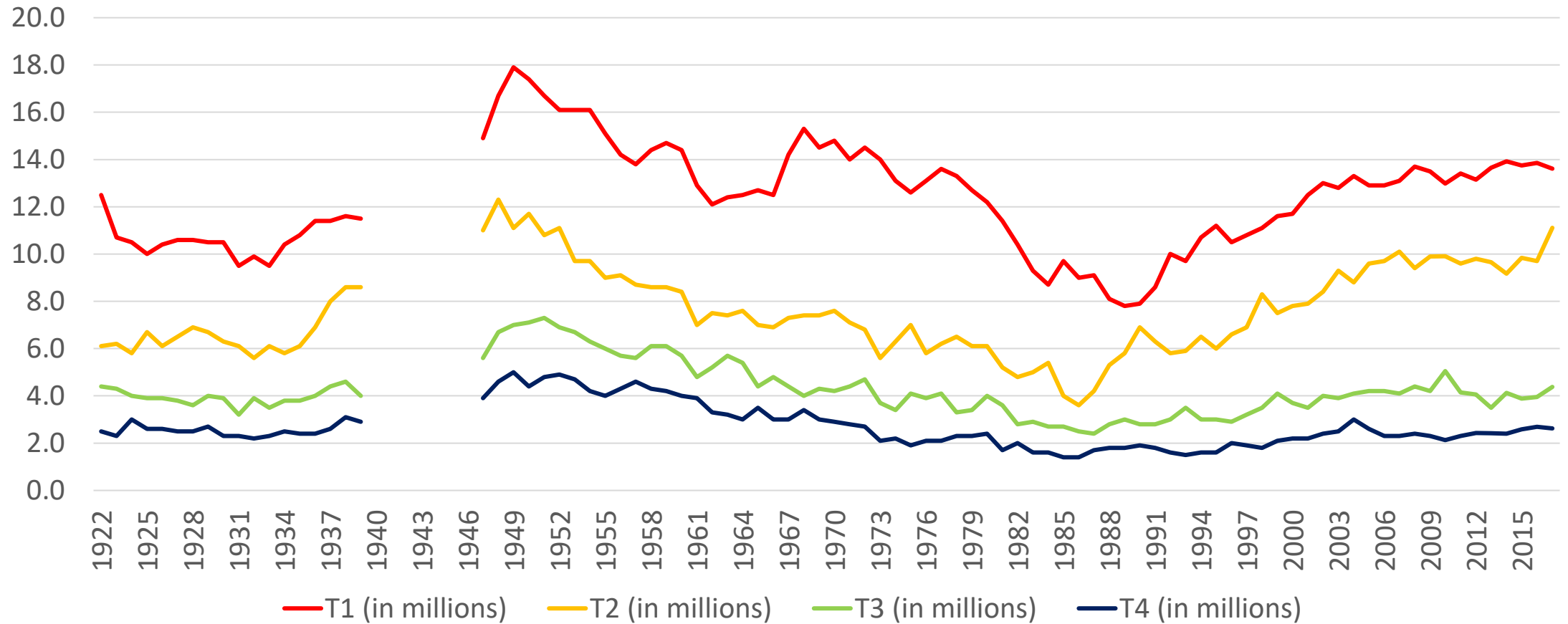
Determinants of attendance demand

The empirical findings

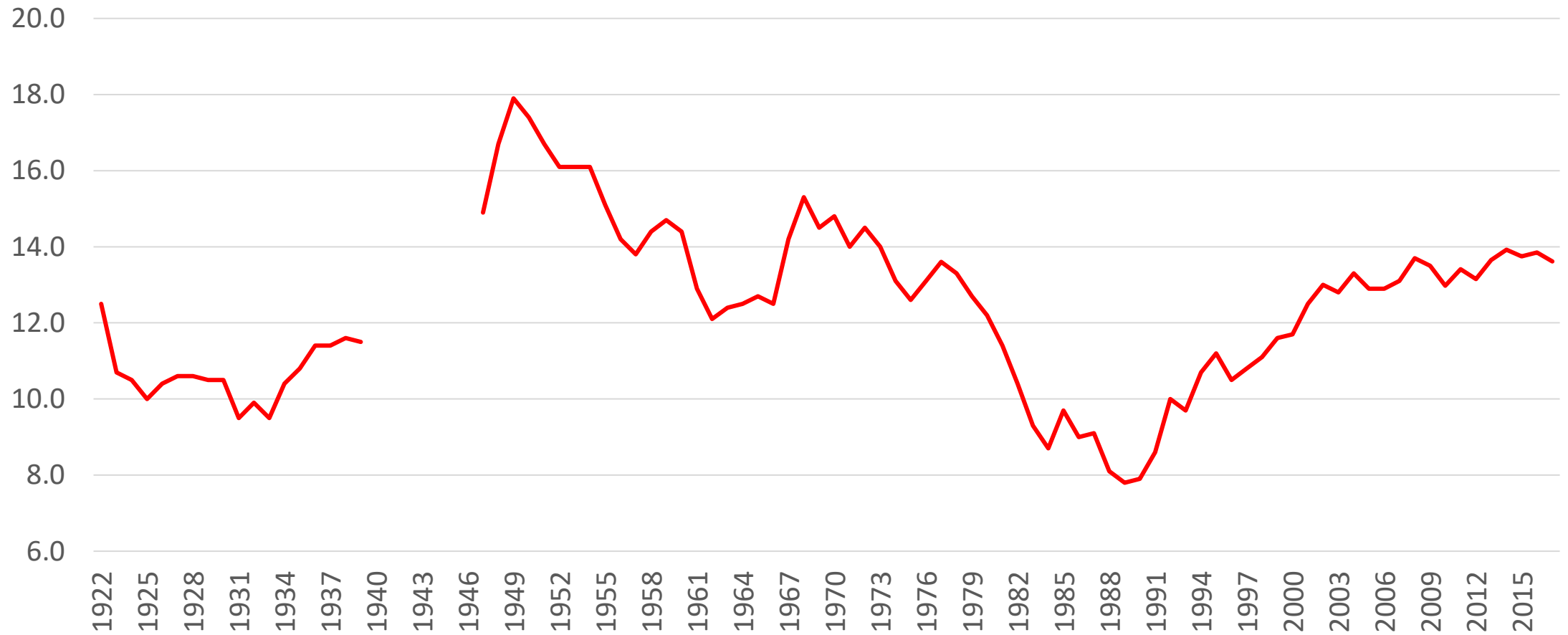
Total attendance in English football (in millions)



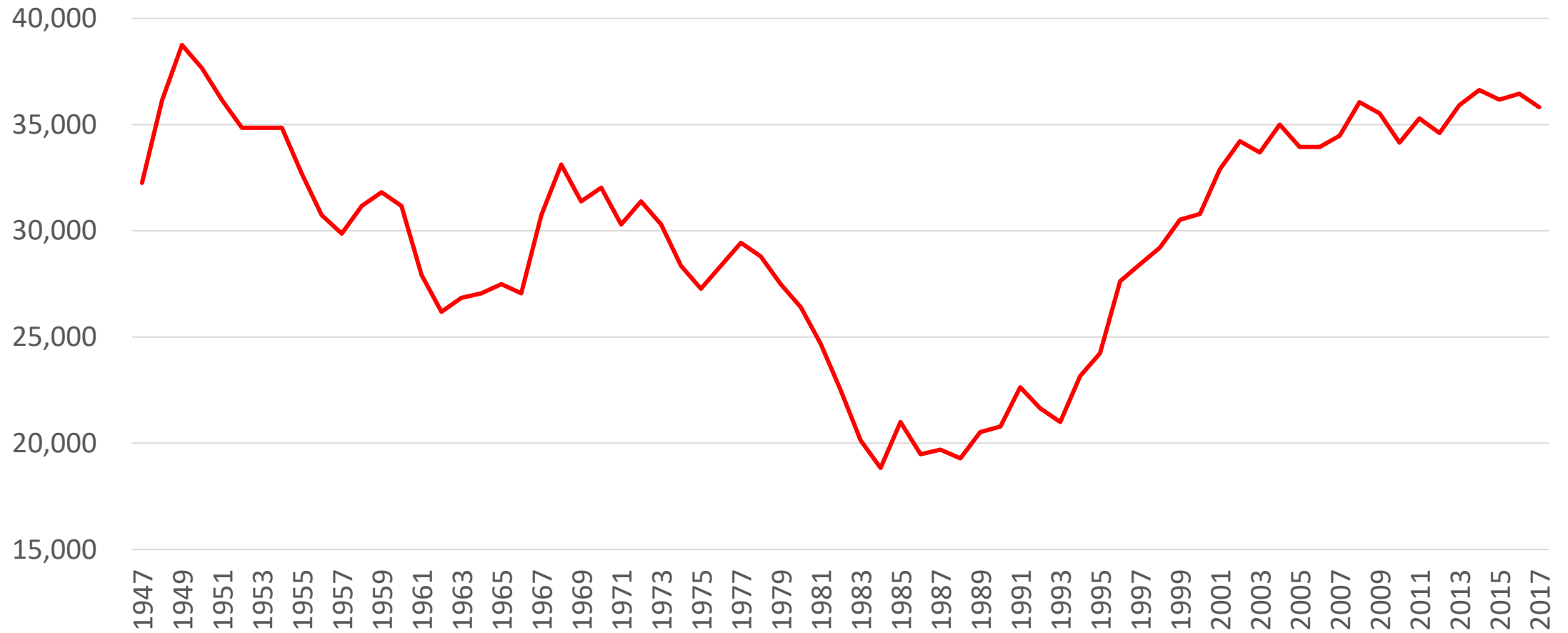
Total attendance in England by tier (in millions),



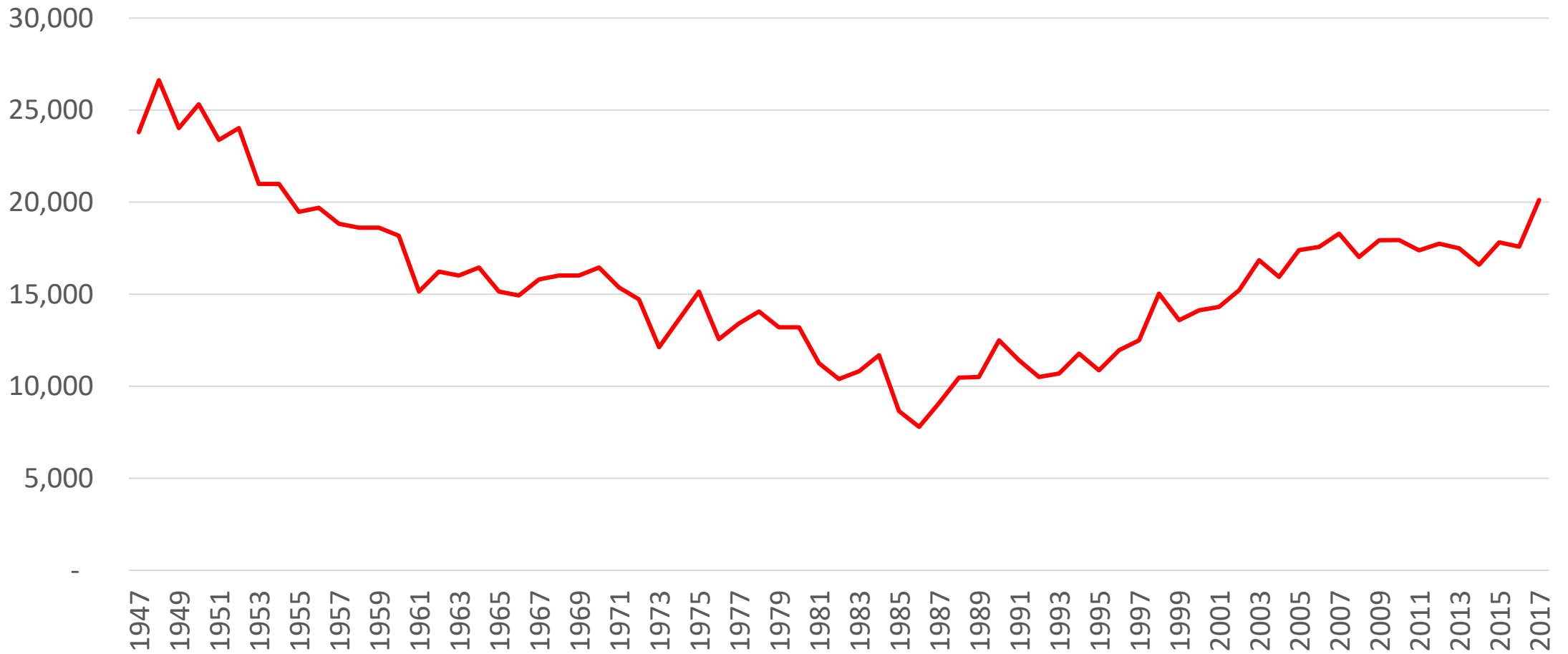
Total attendance in tier 1 (in millions), 1922-2017



Mean attendance in tier 1 (millions), 1947-2017



Total attendance in tier 2 (millions), 1922-2017



Relevance of stadium attendance

For elite leagues, the importance of stadium attendance is reducing since a greater share of revenue comes from other sources (commercial and broadcasting). However, the importance is non-trivial

Across the English Premier League, revenue from attendance is around 25% of total revenue, even lower for 'smaller' clubs

For elite clubs, attendance is complicated by capacity constraint

For clubs outside of the premier leagues (in which broadcasting revenue is limited), revenue from match day attendance is important and critical in many cases.

Key objectives and considerations for clubs

Is and should attendance be maximised?

Increasing prices may be more desirable (assuming it causes a reduction in attendance but increases revenue because demand is '**inelastic**').

In contrast, reducing prices, causing an increase in attendance and revenue, assuming demand is '**elastic**', may be more desirable.

Is football demand elastic, inelastic or unitary? This can be analysed for the whole market as well as individual clubs but relevant for decision-makers.

What are the determinants of stadium attendance demand? How might stadium attendance demand be analysed?

Literature and Demand Studies of Football

Our interest is in stadium attendance demand and particularly the influence of the factors that determine the size of attendance at matches

Perhaps the discipline that has offered extensive attention is economics

The approach often used is regression analysis

$$Q_A = f(P_A, P_1, P_2 \dots P_n, Y)$$

The challenge has been to determine the (precise) relationship between Q_A , the dependent variable, and each of the independent variables

That way, practitioners at both the league and at club levels can *set the independent variables* to a level that achieve the desired outcomes

Literature and Demand Studies of Football

$$Q_A = f(P_A, P_1, P_2 \dots P_n, Y)$$

The independent variables: price(s) and income, are insufficient in providing the comprehensive analysis that's needed.

A range of other (football specific) factors should be considered and these are?

Put another way, what is likely to determine the size of attendance in football stadia?

Determinants of Stadium Attendance

Broadcasting

Day of week

Derby

Distance

Habit persistence

History

Income

Market size

Month

Outcome uncertainty

Playing talent

Price

Price of alternative

Team performance

Trends

Any others?

Independent Variables in the Literature

Habit persistence is normally considered to affect attendance. The notion is that habit, over and above other factors, brings fans back to games. To some extent, it captures the base level of demand there is for a club: loyal fans

Some studies include a measure of how long the clubs has been a member of the league or when it was founded. This captures **history and legacy**. From a management perspective, it captures first mover advantage; *you can't buy history!*

Market size is important since this is the base in which the clubs draws its core attendees. Clubs in small markets are expected to attract relatively fewer attendees compared with teams in larger markets

Team performance could be argued to be the core driver influence attendance. As the performance of teams improve, their attendances are expected to improve also

Independent Variables in the Literature

Derby is often shorthand for local rivalry. It has been long established that football attendees place a premium on matches with their local rivals

Scheduling is important. Simply put, when the match is scheduled: bank holiday, day of the week, and month of the year, even and long-term trend

The role and influence of **broadcasters and TV** will have an effect on attendance and this has influenced decisions on what extent to involve broadcasters in football

Distance affects away fans since it imposes additional costs. The greater the distance they have to travel, the fewer who will make the journey. Not to be confused with Derby

Independent Variables in the Literature

Price is a fundamental determinant of demand and the debate around the barriers to football consumption generally involve price.

Income is a factor and presumably those on higher income have a greater propensity to consumer football (*pies vs prawn sandwiches!*). Consider the rationale of some clubs in creating more hospitality boxes rather than regular seats

Attendees presumably would like to see the best **playing talent** in the match hence talent on show will be a factor

There is the perpetual debate as to whether consumers value **uncertainty of outcome** and should this be a consistent feature

Which of these can clubs influence?

External

History and Legacy
Market size
Distance
Income
Playing talent

League

Market size
Derby
Scheduling
Broadcasting
Distance
Price?
Playing talent
Uncertainty

Club

Habit persistence?
Price
Playing talent

How this can be used by decision-makers

The independent variables are 'levers' that can be pushed and pulled to different levels. In some instances, the independent variables are "switches"

The policies and objectives of the decision-maker (league or club) should determine the 'value the levers are set to' and which switches are on or off

For example, a club looking to maximise profit may set price to a different level from a club looking to maximise revenue

A league looking to maximise attendance will have a policy position on uncertainty depending on the impact of uncertainty on attendance and maybe on the distribution of players across teams

A Demand Study

Allan, G., & Roy, G. (2008). Does television crowd out spectators? New evidence from the Scottish Premier League. *Journal of Sports Economics*, 9(6), 592-605.

In this study, they model **season** tickets separately from '**walk-ups**' and away supports. They even model **away** fans demand

Abstract

This paper examines the impact of live television coverage on attendance at Scottish Premier League soccer matches during the 2002—2003 season. The authors exploit a rich data set which distinguishes match-day attendance into three groups: season ticket holders, pay-at-the-gate home team supporters, and pay-at-the-gate visiting team supporters. This examination of these categories is the first study of its kind. The results indicate matches broadcast live reduce pay-at-the-gate home team supporters by 30%. These results suggest that league administrators and club owners must consider the impact on clubs' traditional supporters when negotiating future broadcasting rights.

Model Specification

To model match-day attendance according to spectator characteristics, we use official SPL data for season 2002-2003.⁹

Average match day attendance was 15,530, just more than half of which are season ticket holders. To determine the impact of television on match-day attendance according to spectator type, we estimate the following model:

$$\begin{aligned} \text{Season Tickets}_{ij,t} = & \phi_i + \phi_1 tv + \phi_2 midweek + \phi_3 derby + \phi_4 dist + \phi_5 dist^2 \\ & + \phi_6 outcome_uncertain + \phi_{7i,j} form + \phi_{8,m} Month_m + \varepsilon_{ij,t}^{ST} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Home}_{ij,t} = & \gamma_i + \eta_1 tv + \eta_2 midweek + \eta_3 derby + \eta_4 dist + \eta_5 dist^2 \\ & + \eta_6 outcome_uncertain + \eta_{7i,j} form + \eta_{8,m} Month_m + \varepsilon_{ij,t}^H \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Visitors}_{ij,t} = & \kappa_i + \lambda_1 tv + \lambda_2 midweek + \lambda_3 derby + \lambda_4 dist + \lambda_5 dist^2 \\ & + \lambda_6 outcome_uncertain + \lambda_{7i,j} form + \lambda_{8,m} Month_m + \varepsilon_{ij,t}^V \end{aligned} \quad (3)$$

Table 1
SUR Estimates of Attendance Demand:
Scottish Premier League (SPL) 2002-2003

Explanatory Variable	Dependent Variable: $\ln Att_{ij}$ (robust standard errors in parentheses)		
	Season Tickets	Pay-at-Gate Home	Pay-at-Gate Visitors
Television	−0.00422 (0.026)	−0.319** (0.12)	−0.141 (0.14)
Midweek	−0.0190 (0.019)	0.0834 (0.091)	−0.0683 (0.10)
Derby	0.0352 (0.031)	0.519* (0.15)	0.650* (0.22)
Distance	NA	NA	−0.00797** (0.0036)
Distance Squared	NA	NA	0.0000366** (0.000017)
Home Form	0.00397 (0.0027)	0.0116 (0.013)	−0.00310 (0.014)
Away Form	−0.00135 (0.0023)	0.00258 (0.011)	0.0169 (0.013)
Home Prospects	−0.000649 (0.00067)	−0.000334 (0.0032)	−0.0107* (0.0036)
Old Firm	−0.0230 (0.033)	0.397** (0.16)	1.287* (0.18)
Rangers vs. Celtic	−0.119*** (0.061)	−0.710** (0.30)	0.557*** (0.33)
August	−0.00871 (0.021)	0.0886 (0.10)	0.252** (0.11)
December	−0.0525 (0.10)	−0.147 (0.093)	−0.0396** (0.019)
May	0.0386*** (0.022)	0.00228 (0.10)	0.209*** (0.12)
R^2	0.99	0.74	0.70
F stat	57718.77	1860.00	539.90
N	228	228	228

*Significant at the 1% level. **Significant at the 5% level. ***Significant at the 10% level.

Some Critical Questions

What are the drawbacks of this model of Scottish stadium attendance demand?

How could the model be improved? Think of 'missing' independent variables

How might the model be used to improve decision-making in Scottish and other league football?

Notwithstanding shortcomings, **what was the purpose of the study? Did it achieve its stated aim?** Have a look at the abstract

Another Demand Study (Championship Division of English Football)

Buraimo, B., Forrest, D., & Simmons, R. (2009). Insights for clubs from modelling match attendance in football. *Journal of the Operational Research Society*, 60(2), 147-155.

In this study, the range of independent variables is extensive but even with such an extensive list, there are arguably some variables that would be of interest, e.g., price, income.

What other variables are missing and could be include. Why have these variables not featured?

Concluding remarks

Modelling attendance is key for decision-makers at both club and league levels if they are to achieve organisational objectives

There needs to be an understanding of the relationships between the independent variables and the dependent variable

Management can 'push, pull and switch' the relevant levers to achieve desired outcomes

Stadium Attendance should not be confused with fan experience and quality of provision.

There may be high attendance in the face of a poor football provision