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Does competitive balance explain stadium attendance? Evidence from Finnish men's football

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ABSTRACT

In this article, we examine the Finnish football league attendance characteristics. Sport leagues usually claim that outcome uncertainty is necessary to maintain interest among fans. In this paper, uncertainty of outcome hypothesis is tested applying football data from the highest tier in Finnish men's football, currently known as Veikkausliiga. The time period covers 1947–2022. Empirical results show that Finnish football attendance is positively related to competitive balance between the rivalling teams. Increased alcohol consumption in the society is not related to football attendance, but we found that the number of games played during the season is positively related to ticket sales. Number of teams in the league seems to be negatively related to attendance. Further studies could investigate the time of the year, the condition of the stadium and the ticket pricing to see whether there is a correlation with on-site attendance.

Introduction

Studying questions about the behaviour of fans, and more specifically, the factors that influence and predict fan attendance have been popular in sport economics research in various sports, such as in American football, baseball, and football (soccer).[1] Nevertheless, spectator demand studies on Nordic football leagues remain an underdeveloped research area.[2] Fans hope their team to win, but those in charge of competition formats aim to create a setting in which the outcome of matches is difficult to predict. Academic research to date in football is enormous, with over 24,000 articles listed on Google Scholar, nearly 14,000 citations listed on PubMed and nearly 60% more articles than the next most studied sport.[3] The aforementioned papers, however, mainly cover leagues in the so-called Big 5 countries in Europe, that is, the Premier League in England, the Bundesliga in Germany, the La Liga in Spain, the Serie A in Italy and the Ligue 1 in France. There is much less research on smaller, so-called 'Beyond the Big 5' football countries, including the Nordic region.[4]This scarcity applies to studies about the economics of football, and more specifically, about the uncertainty of outcome and match attendance as well. Relatedly, increasing the understanding on factors that are associated with attendance is relevant, because in smaller football countries the composition of mainclub revenues – broadcasting, commercial and match-day revenues – may be different to that of Big 5 countries due to, for example, proportionately smaller

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media revenues.[5] In the Finnish context, football research in economics is limited, with only a handful master's dissertations about the topic. This paper addresses the aforementioned gaps and explores factors that have influenced stadium attendance in the top division of Finnish men's football and discusses the broader societal context in which football takes place.The classical research theme in sports economics is the uncertainty of the outcome hypothesis (henceforth, UOH), which is usually labelled as competitive balance and developed by seminal works by Rottenberg[6] and Neale.[7] The theory proposes that successful leagues must be based on relatively even competition. This degree of parity within a league is labelled as competitive balance. Sports leagues usually claim that outcome uncertainty is necessary in order to maintain interest among fans. However, as Mills and Fort note,[8] empirical results on the influence of outcome uncertainty on game attendance are mixed. It is important to note that scholars differentiate between various perspectives of competitive balance: match, seasonal, and the long-term competitive balance, the latter referring to multiple seasons.[9] In the North American Major Leagues, play-off uncertainty has been investigated due to the different league structures as well compared to most European leagues. Gyimesi[10] points out that there is scarce empirical research exploring the link between long-term competitive balance and attendance, and in those existing studies the findings seem to be inconclusive. The most researched field in this subject is the baseball attendance in Major League Baseball (MLB). Attendance behaviour of ice hockey leagues is examined by various researchers.[11] There also exists a wide range of literature on football and basketball. Hart published the first econometric analysis of attendance at English football matches including the uncertainty of outcome measure as one of the explanatory variables.[12] Subsequently, football game attendance has been analysed in several papers, most notably by Forrest and Simmons.[13]

Our research contributes to the existing football literature by testing empirically the revealed preferences, not just behavioural attitudes, or attendance intentions. We use econometric tools for analysing real-world historical football data and apply sociological and economic theories to more conventional viewpoints. This contributes and connects to existing sports economics literature on UOH. It has been noted that especially the research groups focusing on sport management, economics, business, and sociology have been important drivers in football market research.[14]Additionally, we use unique long time-series data (1947–2022) from the Finnish elite football league (Veikkausliiga), as there exists a clear shortage on fan attendance studies on Nordic football scene. Veikkausliiga is the very few summer leagues in Europe, which offers a particularly interesting case in football. Various measures for 'sinful' effects on football fan motivations (alcohol usage, violence) are also considered. In this paper, our focus is on the effect of UOH and economic variables to football attendance in Finland.

The Finnish football context

Finland has been characterized by a strong civic sector with voluntary activities having a key role in running sport clubs, which has delayed the emergence of a market-oriented environment for sport. Football's developmentalong amateur principles were also strengthened by the decision of the Football Association in the 1920s.[15] Alack offitforpurpose facilities, late urbanization, and an agriculture-focused economic structure were not favourable for professional football either.[16] Finland is a country where modernization and nation-building processes occurred – contrary to many other European countries – without football playing a key role. The social and cultural relevance of football did not appear until the postmodern era in those countries.[17] Even though football is the most popular team sport when looking at the number of registered players, participation on the grassroots level, for a long time, did not translate into international success or considerable growth in attendance.[18] Indeed, the number one spectator sport in the country is ice hockey, currently only rivalled by the emerging e-sportscene.[19]

Since the 1970s, commercial actors have started to play an increasing role in the sports landscape. The involvement of the market has become essential as running clubs competitively require

resources. Market actors expected increasing publicity. Consequently, the sport product – market – media triangleemerged, marked by interdependencies between the actors involved. The league system with launching the Veikkausliiga as the top tier in men's football took place in 1989. This can be seen as a clear sign of professionalization; however, up to now no significant football business has emerged in Finland. Even nowadays, the clubs in Veikkausliiga represent semi-professionalism of various degrees. Nevertheless, these developments suggest that Finland has been increasingly connected to the international football system.

Attendance numbers have remained quite stable during the last decades in the top division. In Figure 1, the average attendance numbers are presented. With the Championship series established in 1930– the first national series in a league format – football's popularity has gradually grown in the 1940's among spectators, which has been reflected in moderate attendance levels since then.

In Table 1, the basic characteristics of Veikkausliiga teams are presented. A club from the Finnish capital Helsinki, HJK, has the longest and most successful history – with a stunning total of 31 league titles on the men's side – in Veikkausliiga.

Veikkausliiga is currently made up of 12 teams with a typical European open league system. The team finishing 11th plays a two-legged relegation battle against the second-placed team from the First Division (Ykkönen). Since the 2018–2019 season, Veikkausliiga has undergone a structural change with the implementation of a play-off phase after the regular season. The aim is to create more meaningful games and excitement towards the end of the season. The regular season is played as a round robin tournament, bringing the total number of matches to 132. The table is then split into an upper six-team 'Championship Series' and a lower 'RelegationSeries' made up of the lowest placed teams. The winner of the championship series wins the championship, and the lowest placed team in the relegation series drops to Ykkönen. Further, a five-team final stage is played to determine the allocation of a UEFA Europa League qualifier spot for the following season. These modifications have increased the total number of games played to 167 during the season.

Theoretical framework and research on stadium attendance

The first contributions to the economics of soccer literature are widely acknowledged as being analysed by Peter Sloane. He was the first to note the special characteristics of soccer players' labour market and he questioned the appropriateness of a profit-maximizing objective function for soccer team owners. More relevant to our work, he also discusses the implications for special competitive

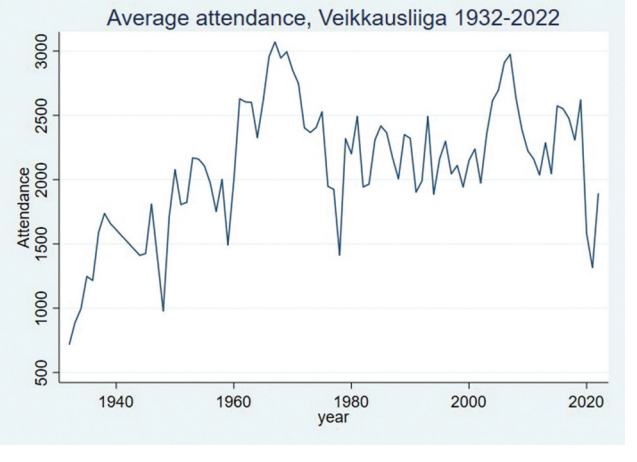

Figure 1. Average attendance of the championship series (mestaruussarja 1948–1989) and Veikkausliiga (1990–2022), time period of 1948–2022. Source: The Football Association of Finland statistics.

Table 1. Veikkausliiga teams in the 2023 season (summer season from April to October), ordered by the number of seasons played in the top tier league.

Club	City	Stadium	Capacity	# of seasons
HJK	Helsinki	Bolt Arena	10,770	83
KuPS	Kuopio	Savon Sanomat Areena	5,000	65
FC Haka	Valkeakoski	Tehtaankenttä	3,516	64
VPS	Vaasa	Elisa Stadion	6,009	57
FC Lahti	Lahti	Lahti	4,000	49
Ilves	Tampere	Tampere Stadion	16,800	40
FC Inter	Turku	Veritas Stadion	9,372	25
IFK Mariehamn	Mariehamn	Wiklöf Holding Arena	1,650	17
FC Honka	Espoo	TapiolanUrheilupuisto	4,100	13
SJK	Seinäjoki	OmaSP Stadion	6,000	11
KTP	Kotka	Arto Tolsa Arena	4,780	9
AC Oulu	Oulu	Raatti Stadium	4,392	3

Note: Number of seasons includes seasons played in Veikkausliiga (1990–present) and preceding Mestaruussarja (1948–1989) and seasons of predecessor teams after season 2022. In the case of mergers, the seasons of the predecessor with the most seasons are counted.

environment of team sports compared to other industries.[20] The collective interest of a league's member teams in preserving some degree of competitive balance to maximize spectator interest makes elite team sports business environment unique related to other conventional industries.[21] A well-documented review of contemporary attendance factors is written by Patrick Feehan.[22]

A recent review of the current attendance literature by Dominik Schreyer and Payam Ansari[23] concludes that while there is a rich and continually growing body of empirical literature modelling the determinants of stadium attendance research, analysis on smaller football leagues is lacking. As several researchers note, spectator demand studies on Nordic football leagues remain an underdeveloped research area.[24] In this article, we aim to alleviate this shortage by examining the Finnish football league attendance characteristics.

As with usual products and services, attendance demand is influenced by economic factors, such as price and income. In addition, team performance, uncertainty of outcome, competition from televised games, sociological factors, match scheduling, weather conditions, the rivalry of teams, and the size of the league are potential explanatory variables for stadium attendance.[25]

Recent scientific literature in football has seen numerous approaches applied by scholars to gain a better understanding of stadium attendance across various elite leagues. Bradbury pointed out that, in accordance with many earlier studies, on-field performance is positively correlated with attendance.[26] Positive novelty effects for newer teams and football-specific stadiums have also been identified; nevertheless, stadium age did not prove to be significant. Furthermore, substitution in demand has been looked at in the German context with the finding that scheduling overlaps (spatial and/or temporal overlaps) of games across divisions affect demand.[27]

Demand variables explaining stadium attendance typically include consumer preferences, economic variables, quality of viewing and characteristics of the sporting contest.[28] In this paper, we will concentrate on examining these types of explanatory variables. UOH, which attempts to capture the competitive balance of a match or a league, has been an especially popular concept to explain football attendance. Research on league-level UOH has continuously taken steps forwards, for instance, by applying the concept of ranking mobility as a dynamic indicator of long-term competitive balance.[29] In addition, some researchers have employed the concepts of competitive advantage as well as competitive intensity, the latter enabling a more nuanced analysis by taking into consideration the relevance of league standing and sporting stakes when calculating the uncertainty of outcome.[30] Measuringcompetitive balance – when looking at end-of-season outcomes – may be carried out by way of two fundamental dimensions, win dispersion (static, within season) and performance persistence (dynamic, across season).[31] Despite the growing literature on the topic, UOH remains a controversial subject on attendance literature as it is not unanimously supported in the empirical research. Nevertheless, even an opposite effect can be found on several

occasions.[32] Many spectators support the home team and therefore rather prefer to see their team play a much inferior team when winning is more probable. Fans rather care about the reputation of clubs than the thrill of outcome uncertainty.[33] On the other hand, several papers find support on the outcome uncertainty hypothesis.[34]UOH will be one of the main explanatory variables in our attendance modelling.

There exist various theoretical schools for explaining the football fan behaviour. We draw our empirical model mainly on the*personal investment theory*(PIT)[35] which offers a multi-pronged explanation of factors explaining the attendance decisions of sports consumers. Figure 2 reveals the connection between PIT and other contemporary attendance theories. PIT divides attendance antecedents into three main categories: fan-focused, relationship-focused, and product-focused antecedents. First, regarding the fan-focused factors, Sloan named five main theoretical bases, which are salubrious effects, stress and stimulation seeking, catharsis and aggression, entertainment, and achievement-seeking theories.[36] Fan motivation for attendance surges from various sources. Sports involvement is attractive, because it provides pleasure, mental well-being, reduces aggression levels, gives aesthetic entertainment, and gives life manageable amount of positive stress and stimulation. As Frey and Gullo show,[37] sports give its practitioners happiness (more than any other way around). Sports allow people to relieve the strain of everyday life by providing excitement. Spectating sports brings people happiness,[38] which is also supported by Baade and Tiehen.[39]

Second, relationship-focused factors stem from identification, trust, and commitment. In addition to the PIT, these factors are also relevant to the social identity theory (SIT), which focuses on identification with an entity which can influence how individuals think, act and feel, because a key function of the entity (e.g. team or organization) is providing members with a strong sense of who they are based on their membership with the entity.[40] Indeed, membership of a social group, for example being a football team fan, is an important mediator of an individual's cognitive and behavioural processes. Relationship-focused factors can also be analysed within the context of the Serious Leisure Perspective (SLP) developed by Stebbins.[41] Further, the Psychological Continuum Model (PCM)[42] elaborates the analysis of the relationship-focused factors.

Third, product-focused factors can be best captured by contemporary economic theory, which suggests that the demand for spectator sports depends on various economic and other determinants.[43] Those include, for example, the price of the event, incomes of spectators,

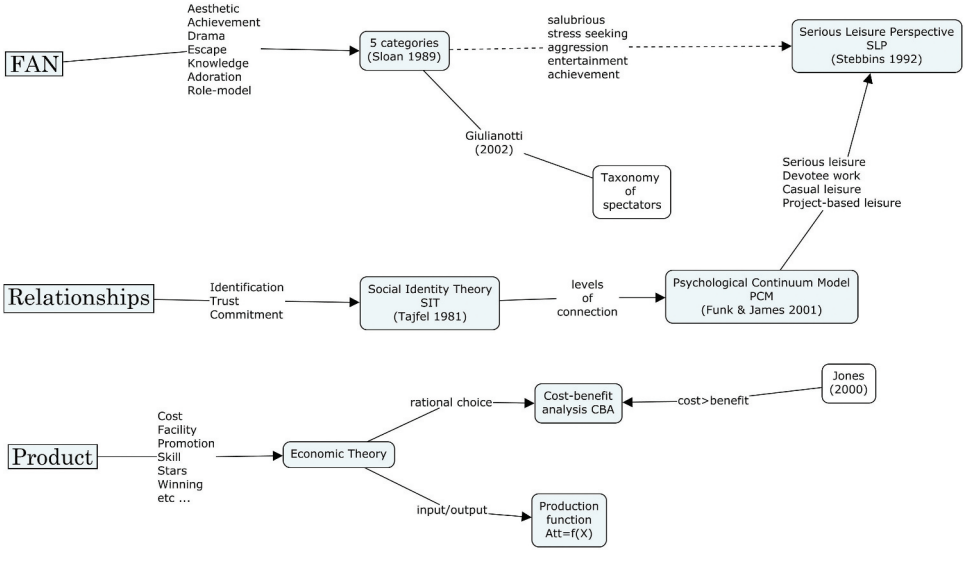

Figure 2. Personal investment theory and its relationship to other attendance theories.

unemployment, prices of substitutes groups, market size (usually proxied by local population), importance of the contest, and closeness of the competition (measured by the uncertainty of outcome).

Drawing on this broad framework provided by PIT, we sharpen our focus by applying fan-focused and product-focused variables as explanatory variables. Unfortunately, we do not have valid data for relationship-focused variables. Nevertheless, we use several quality of viewing and sporting contest characteristic variables (such as the number of goals, number of teams in the league and number of games during the season). Characteristics of the sporting contest also include the quality of the games. The number of goals scored during the games increases fan excitement, so that is often used as an explanatory variable in attendance studies.[44] The number of games played during the season is typically included in attendance models.[45] More games played increases the total seasonal attendance and could also increase the average gameday attendance as the league gets more media attention.

Several studies have also included the number of the teams in the league as an explanatory variable. Increasing the number of teams in the league could reduce the attendance, as there will be more games with greater points' difference between the teams and more matches of less importance, more games with bad weather and the inclusion of teams from smaller towns. A number of teams have usually been found to be having a negative effect on the attendance.[46] On the other hand, more teams in the league could also increase the number of local derbies and geographical coverage, which could have a positive effect.

Our main focus in this paper is using UOH and additionally also economic factors (incomes and unemployment) as explanatory variables to test the significance of those variables suggested by economic theory. UOH measures the relative quality of the games.[47] Economic variables are essential for the potential spectators' budget constraints and for factors that affect their attendance costs. Increased income and lower cost increase demand for spectator sports. Economic growth, income level and unemployment rate are examples of variables representing the budget constraints for fans (measured at the macro-economic level). Football ticket is usually found to be a normal good as income is positively associated with sports' spectatorship,[48] while some results suggest that football spectating might in some cases be an inferior good with a small price elasticity.[49] Unemployment is usually found to be positively associated with attendance. Increased spare time outweighs the direct decrease in purchasing power.[50]

Several studies also include the geographical explanatory variable regarding the size of the population in the area. Population is usually a significant and positive driver for attendance.[51] In addition to PIT, when choosing the applied demand explanatory variables, we follow the example of previous research where demand variables are explaining consumer preferences, quality of viewing, characteristics of the sporting contest and economic variables.[52]

Data and model

The time-series model is estimated to explain the attendance of Finnish men's top division football matches (on the league level). The data consists of the years 1947–2022 with 72 yearly observations of the variables, which is the maximum data period for which the data is available from the reliable public sources of the Football Association of Finland.

Demand factors of elite sports are commonly analysed applying Rottenberg's uncertainty of outcome hypothesis (UOH).[53] It states that fans prefer close matches between rivalling teams. Uncertainty of result makes games interesting and worth buying an entrance ticket. It has been previously estimated that the ideal probability of winning is about 60–66%, favouring home team win but leaving some uncertainty and excitement into match day.[54]

Competitive balance is usually evaluated using various measurements. The most commonly used measurement is 'r' ratio, which is the actual standard deviation of winning percentages to the ideal standard deviation.[55]Alternative measurements include the Herfindahl–Hirschman index and the Gini coefficient. In our model, the competitive balance is measured

by the value of 'r'-ratio, which is calculated as a relation of actual-to-idealized standard deviation.

The value of the actual-to-idealized standard deviation is calculated as:

$$r_t = \frac{\sqrt{\sum_{i=1}^{N} \left[w_{i,t} - 0.5\right]^2 / N_t}}{0.5/\sqrt{s_t}}$$

where $w_{i,t}$ is the win quotient for team i in season t, N is the number of teams, and s is the season length in rounds. The larger value of 'r' implies a more competitive unbalance between the teams of the league. If competitive balance is an important factor for game attendance, a negative sign is assumed for the regression coefficient estimator.

The focus is to test whether competitive balance can significantly explain the attendance. In addition to the plain 'r' –ratio, also squared competitive balance indicator was considered as an alternative explanatory variable to test for possible nonlinear effects, but no nonlinearities were found. Therefore, no nonlinear competitive balance indicators are included in our model. In this paper, our perspective is the long-term competitive balance (multiple seasons) as opposed to short-term (single game) and mid-term (one season).

Finnish sports culture includes alcohol consumption during the games as one important factor for drawing more fans to see matches. Additionally, there is a clear increasing trend of alcohol consumption in Finland since 1970s, being nowadays about 10 l per capita (over 15 years old population and pure 100% alcohol). According to research on Finnish sports fan base, over 50% of the Finnish fans believe that alcohol consumption increases the entertainment value of elite sports.[56] The percentage of positive attitudes is especially high among the fans of football and ice-hockey. Finnish society has changed for more open-minded alcohol consumption in public spaces such as football arenas. Consumption behaviour has transformed from spirits to beer and wine drinking, which has maybe become one element of the game experience for some football fans. Therefore, the alcohol consumption trend is also tested as a potential explanatory variable to the model.[57]

Our estimated models include the explanatory variables suggested by the PIT and previous research literature on soccer stadium attendance. Several basic economic variables are also included in the model as game tickets of elite series are expensive and attendance could be assumed to increase during the economic booms and decrease when the economy hits into recession. The economic variables included in the model are per capita economic growth and unemployment. Negative sign for unemployment variable is assumed as game tickets are expensive in Finland. On the other hand, unemployed people would have more free time to spend in games so the assumed correlation is somewhat ambivalent.

The number of games played during the season, the number of goals and the number of teams in the league are included for obvious reasons as more games, goals and more teams imply more ticket sales. The number of goals made increases the entertainment value and the quality of games, thus increasing the attendance. We also include Finnish population data to our model and test its significance, as it could be argued that changes in the overall national population would increase the potential attendance to football games.

Football is not a violent sport (contrary to, e.g., ice-hockey, which is the most popular spectator sport in Finland nowadays), but we also allowed the possibility of violent behaviour on the field to affect fan enthusiasm in some way. Aggressive play on the field could entertain some fans but may be a negative signal for family-oriented spectators. Therefore, we do not make any assumptions of the sign or significance of the penalty variable. A number of penalties (yellow and red cards) were tested for correlation with attendance, but no signals of any relation were found. Attendance measures had no statistically significant correlation with yellow or red cards given during the season. Correlation coefficients were −0.4974 and −0.3534 with yellow and red cards, respectively. Therefore, any variable for the number of penalties is not included in our final models. In model

building, 'lasso' (=least absolute shrinkage and selection operator) technique was applied. Lasso regression is a type of linear regression that uses shrinkage. Shrinkage is where data values are shrunk towards a central point, like the mean. The lasso procedure encourages simple, sparse models (i.e. models with fewer parameters). All the variables are in log-difference form.

Therefore, the final model is estimated as:

$$\begin{aligned} \text{ATTENDANCE}_t = {} & \alpha_0 + \beta_1\ \text{CompetitiveBalance} + \beta_2\#\text{games} + \beta_3\#\text{goals} + \beta_4\#\text{teams} \\ & + \beta_5\ \text{Alcohol consumption} + \beta_6\text{Population} + \beta_7\text{Economic Growth} \\ & + \beta_8\text{Unemployment} + \varepsilon_t\ \text{(residual, i.i.d. normally distributed)} \end{aligned}$$

We tested five alternative model formulations applying stepwise estimation technique and finally reduced the model to the most usable version (model 5) found in table 5.

Results and discussion

According to our estimation results presented in Table 2, the competitive balance is statistically strongly significant explanatory variable for Finnish football attendance demand. The co-efficient is negative as suggested by UOH – meaning a higher competitive balance is associated with higher attendances – and is statistically strongly significant (at the 1% level) in all our tested model variants. Therefore, we find empirical support for UOH in the Finnish football league. In estimations we have applied the time-series estimation techniques and tested all variables for unit-root properties. Variables are in different log-formats. Stepwise model selection and reduction techniques are applied, and all five potential model formulations are presented in Table 2.

The number of goals made in matches is significant in model variant 5. Even though more goals would assume more fans on the premises – also suggested in the PIT framework with fans looking for aesthetics and drama – the importance of the number of goals seems not to be a very important factor explaining football match attendance. The coefficient is significant only in model 5.

The average attendance increases when the number of teams in the league decreases. There are only a limited number of potential fans and a higher number of teams in the league imply more competition on fans' ticket budgets. Attendance also increases when the number of games played during the football season increases. Increased activity during the football season, implying more games played, increases media attention, and brings more fans to football stands. Season ticket holders gain more match time and football entertainment for their money when the number of games increases. Due to adjusting stadiums by adding underneath heating and changing natural grass to artificial turf over the past decade, the quality of the pitches has become better throughout the season, the watching experience has improved with roofs over stands, and the Veikkausliiga season has become longer, stretching today from April to the end of October.

Further, economic growth seems to contribute positively to football attendance, which is in line with our assumptions. Increasing incomes and economic possibilities enable growth in football ticket sales. Nevertheless, unemployment is not a significant variable in our model. We also tested the significance of the population variable in our model, but it was found not to be relevant for our analysis. Changes in the overall population could be argued as being a significant explanatory factor for football attendance, but that was not found to be so. Population variable was not found to be statistically significant in any of the model versions. Enthusiastic football fans, considering buying an entrance ticket, are such a small facture of Finnish total population, that its changes do not affect our model outcome. Alcohol consumption is not significant in our estimations. Increased attendance in football matches is not correlated with more liberal alcohol usage in Finland.

A limitation of our study is that ticket prices could have been a relevant estimator to be looked at, but there are no available data on them for such a long period. The potential added values as well as the lack of aggregate information and access to ticket prices have been noted in other studies as

Table 2. Explanatory variables for mean attendance of Veikkausliiga football matches. Time series of veikkausliiga 1947–2022. Variables in differences (variables tested for no unit roots).

	Dependent variable: Attendance				
	Model 1	Model 2	Model 3	Model 4	Model 5
UOH	−0.232***	−0.225***	−0.236***	−0.215***	−0.224***
	−0.074	−0.073	−0.071	−0.075	−0.074
# of goals	−0.115	−0.11		−0.123	0.259*
	−0.22	−0.217		−0.227	−0.146
# of teams	−0.680**	−0.726**	−0.800***		−0.567*
	−0.32	−0.309	−0.297		−0.289
# of games	0.552**	0.561**	0.488***	0.35	
	−0.268	−0.265	−0.17	−0.258	
Alcohol consumption	−0.161				
	−0.298				
Population	7.596	5.311			
	−6.93	−5.937			
Income	0.013**	0.011*	0.011*	0.012**	0.011*
	−0.006	−0.006	−0.006	−0.006	−0.006
Unemployment	0.003				
	−0.006				
Constant	−0.081	−0.051	−0.024	−0.025	−0.022
	−0.067	−0.037	−0.023	−0.024	−0.024
Observations	72	72	72	72	72
R^2	0.265	0.254	0.242	0.164	0.187
Adjusted R^2	0.171	0.185	0.197	0.114	0.139
Residual Std. Error	0.152	0.151	0.15	0.157	0.155
	(df = 63)	(df = 65)	(df = 67)	(df = 67)	(df = 67)
F Statistic	2.836***	3.694***	5.351***	3.275**	3.861***
	(8;63)	(6; 65)	(4; 67)	(4; 67)	(4; 67)

Note: All variables tested for unit-root properties. Variables in difference of logs-format.Autocorrelation, het.sked. and stationarity tests are robust.Unit roots tested by using traditional Dickey-Fuller procedure[60] and with a modified D-F test.[61]

well.[58] We had no information about season ticket holders either. Nevertheless, there is a general consensus that spectators at all team sports are highly unresponsive to changes in the admission price, that is, demand is price inelastic.[59]

Our estimation results are in line with PIT, as both the fan- and product-focused factors applied in the estimated models are relevant to some extent. The coefficient of UOH-variable implies that both types of factors are significant explanators of fan attendance. The number of goals made suggests aesthetic and achievement factors being relevant to the fan-focused factors. The number of teams and the number of games played during the season underlines the importance of product-focused factors as they imply the accessibility of the games available for the fans. Income and other economic variables provide information about the product-related factors as the economic boundary conditions affect the ticket sales decisions. Unfortunately, we are restricted to analysing only fan- and product-focused factors, as the relationship-focused factors are not easily measurable and are not included in our dataset. In the forthcoming analyses, we hope to be able to also consider those factors.

Conclusion, implications, and future research perspectives

This is the first paper where UOH is tested using the Finnish highest men's football league Veikkausliiga. Higher competitive balance increases the attendance of football matches as fans are likely to prefer close games between the teams. Economic variables such as income growth and unemployment were also analysed, and increasing incomes and economic prosperity increased the game attendance. Nevertheless, unemployment was not found to be a significant explanatory variable in our models.

Much of the research on sports attendance has looked at behavioural attitudes and attendance intentions as opposed to actual attendance.[62] In this paper, we analysed empirically the actual attendance levels, and grounded our model on a valid theoretical base, the personal investment theory. We applied the PIT-theory in attendance estimations and included variables representing fan-focused and product-focused factors in our empirical models. Estimation results obtained are in line with the uncertainty of the outcome hypothesis (UOH), indicating a higher number of fans when the competitive balance is stronger.

Both fan-focused and product-focused factors seem to be relevant regarding attendance. Entertainment value of the games increases when the fans see more goals during the games, and we also found that being a somewhat significant factor for attendance. Our findings reveal that average attendance increases when the number of teams in the league decreases, which suggests that there are a limited number of teams that can attract a decent crowd in Finland. Their ability to do so stems most likely from their recent and historical success on the pitch and the catchment area in which they operate. These clubs currently are HJK from Helsinki, KuPS from Kuopio, and SJK from Seinäjoki. Therefore, from the business management perspective of the clubs, the number of teams in the league is worth keeping within a reasonable limit. The city of Tampere will see a brand-new 8000-seater stadium open in 2024 that will provide home from the club Ilves, which may add to the competitive balance of the league. Nevertheless, from a player development perspective, some might argue that a higher number of teams would favour home-grown talent to get playing time and grow the pool of quality players to choose from for the national team as well as to sell abroad. These findings have implications when designing competition formats.

We have found in our time-series analysis that attendance increases when the number of games played during the football season increases. The past decade has been marked by the domination of the league by HJK; however, KuPS and SJK have been putting pressure on them in recent years. Indeed, in the 2022 season, HJK won the league in the very last round with a draw away against KuPS. In 2023, a similar scenario played out with HJK securing their first place in the last round of the season. Analysing changes and experiments in the format, for example, the introduction of a championship group and a relegation group in the final phases of the season to maintain suspense since 2018 will provide interesting topics for follow-up studies.

We did not find a correlation between fan attendance and the increasing trend of alcohol consumption habits in Finland. Increased attendance in football matches is not correlated with more liberal alcohol usage in Finland. This may be due to the more restricted beverage provision in football compared to ice hockey games and potentially with the composition of spectators. A recent study has found increased alcohol consumption in Finland, and ice-hockey ticket-sales are indeed positively related.[63]

Building on this paper – which is a sort of kick-off in this line of research in the Finnish context – there are numerous opportunities for future avenues as this paper is a sort of kick-off in this line of research in the Finnish context. Further studies could investigate whether the time of the year, the condition, age, and the location of the stadium, as well as ticket pricing, the popularity of football in a given locality and whether the matches are broadcast have a correlation with fan attendance. Consumption differences between season ticket holders and single ticket buyers could be explored as well.[64]In addition, given their growing popularity, the context of women's football as well as futsal should receive more attention from researchers in sport management and sport economics researchers.

Notes

1. Feehan, *Attendance at Sports Events*; Gouguet, *The Demand for Sport*; Simmons, *The Demand for Spectator Sports*.
2. Kringstad, Jakobsen, and Storm. *Nordic Spectator Studies. The Literature on Attendance and Satisfaction at Professional Football Matches*, 215.

3. Kirkendall, *Evolution of Soccer as a Research Topic*.
4. see for example Kringstad et al., *Does live broadcasting reduce stadium attendance? The case of Norwegian football*; Nielsen et al. *The impact of English Premier League broadcasts on Danish spectator demand: a small league perspective*.
5. Szerovay and Itkonen, *The changing field of professional football stadiums in Finland and Hungary*.
6. Rottenberg, *The Baseball Player's Labour Market*.
7. Neale, *The Peculiar Economics of Professional Sports*.
8. Mills and Fort,*Team-Level Time Series Analysis in MLB, the NBA, and the NHL*.
9. Borland and MacDonald, *Demand for Sport*.
10. Gyimesi, *League Ranking Mobility Affects Attendance*.
11. See e.g. Jones, *The Economics of the National Hockey League*; Ferguson et al., *The Pricing of Sports Events*.
12. Hart et al.,*A Statistical Analysis of Association Football Attendances*.
13. Forrest and Simmons,*Outcome Uncertainty and Attendance Demand in Sport: The Case of English Soccer*.
14. Kringstad, Jakobsen, and Storm. *Nordic Spectator Studies. The Literature on Attendance and Satisfaction at Professional Football Matches*.
15. Itkonen et al., *Kuningaspelin Kentät*.
16. Itkonen and Nevala, *A Popular Game in Father Christmas Land? Football in Finland*, 579.
17. Giulianotti, *Football: A Sociology of the Global Game*.
18. Itkonen et al., *Kuningaspelin Kentät*, 20.
19. Sponsor Insight.
20. Sloane, *Restriction of Competition in Professional Team Sports*; Sloane, *The Labour Market in Professional Football*; Sloane, *The Economics of Professional Football: The Football Club as a Utility Maximiser*.
21. Goddard, *The Economics of Soccer*.
22. Feehan, *Attendance at Sports Events*.
23. Schreyer and Ansari, *Stadium Attendance Demand Research: A Scoping Review*.
24. Kringstad, Jakobsen, and Storm. *Nordic Spectator Studies. The Literature on Attendance and Satisfaction at Professional Football Matches, 208*.
25. Kringstad, Jakobsen, and Storm. *Nordic Spectator Studies. The Literature on Attendance and Satisfaction at Professional Football Matches, 210–213*.
26. Bradbury, *Determinants of Attendance in Major League Soccer*.
27. Wallrafen et al., *Substitution in Sports: The Case of Lower Division Football Attendance*.
28. Kringstad, Jakobsen, and Storm. *Nordic Spectator Studies. The Literature on Attendance and Satisfaction at Professional Football Matches, 212*.
29. Gyimesi, *League Ranking Mobility Affects Attendance*.
30. Scelles et al., *Competitive Balance versus Competitive Intensity before a Match*; Hautbois (et al.), *Influence of competitive intensity on stadium attendance*.
31. Gerrard and Kringstad, *The multi-dimensionality of competitive balance*.
32. Buraimo, *Stadium Attendance and Television Audience Demand in English League Football*.
33. Pawlowski and Anders, *Stadium attendance in German professional football – the (un)importance of uncertainty of outcome reconsidered*.
34. see f.e. Forrest and Simmons, *Outcome Uncertainty and Attendance Demand in Sport: The Case of English Soccer*.
35. Maehr and Braskamp, *The motivation factor: A theory of personal investment*.
36. Sloan, *The motives of sports fans*.
37. Frey and Gullo, *Does Sports Make People Happier, or Do Happy People More Sports?*
38. Dunning, *Sport Matters*.
39. Baade and Tiehen, *An Analysis of Major League Baseball Attendance*.
40. Tajfel, *Human groups and social categories*; Tajfel et al., *An integrative theory of intergroup conflict, 56*.
41. Stebbins, *Serious leisure and well-being*.
42. further developed especially by:Groot and Robinson, *Sport fan attachment and the psychological continuum model*;Funk and James, *The Psychological Continuum Model*.
43. Simmons, *The Demand for Spectator Sports*, 79.
44. Borland and MacDonald, *Demand for Sport*; Mehus, *Sociability and excitement motives of spectators attending entertainment sport events*.
45. Borland and MacDonald, *Demand for Sport*.
46. Kringstad, Jakobsen, and Storm. *Nordic Spectator Studies. The Literature on Attendance and Satisfaction at Professional Football Matches, 214*; Skjetne, *Effekten av en utvidelse av Tippeligaen fra 14 til 16 lag.*; Framås, *Etterspørselsanalyse av tilskuertallet i Tippeligaen*.
47. Gerrard and Kringstad, *The multi-dimensionality of competitive balance: evidence from European football*.
48. Thrane, *Sport spectatorship in Scandinavia: A class phenomenon?*

49. Bird, *The demand for league football*.
50. Framås, *Etterspørselsanalyse av tilskuertallet i Tippeligaen*.
51. Borland and MacDonald, *Demand for Sport*; Kringstad, Solberg and Jakobsen, *Does live broadcasting reduce stadium attendance? The case of Norwegian football*.
52. Borland and MacDonald, *Demand for Sport*; Bond and Addesa, *Competitive Intensity, Fans' Expectations, and Match-Day Tickets Sold in the Italian Football Serie A, 2012–2015*; Caruso, Addesaand Di Domizio, *The Determinants of the TV Demand for Soccer: Empirical Evidence on Italian Serie A for the Period 2008–2015*.
53. Rottenberg, *The Baseball Player's Labour Market*.
54. Knowles and Sherony, *The Demand for Major League Baseball*, 77.
55. Baydina et al., *Uncertainty of Outcome and Attendance*.
56. Heinonen & Godenhjelm, *Ohranjyvä silmässä: Suomalaiset urheiluyleisöt ja alkoholi*,25–27.
57. Thompson et al., *Drinkers, Non-Drinkers and Deferrers*.
58. Simmons, *The Demand for Spectator Sports*.
59. Feehan, *Attendance at Sports Events*.
60. Dickey and Fuller, *Distribution of the Estimators for Autoregressive Time Series With a Unit Root*.
61. Elliott et al., *Efficient Tests for an Autoregressive Unit Root*.
62. Kim et al., *Meta-Analytic Review of Sport Consumption*.
63. Mangeloja et al., *Jääkiekkoviihteen kysyntätekijät*.
64. Solberg and Mehus. *The Challenge of Attracting Football Fans to Stadia?*
65. Mangeloja and Szerovay. *Football match attendance in Finland*.

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