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Abstract

This study examines the private consumption benefits of sports attendance using revealed and stated preference data from 28 Football Bundesliga teams across three divisions. Survey respondents were presented with positive (sporting success) and negative (management failure) scenarios and asked for the number of game trips if each scenario occurred. The results of random effects Poisson models show that travel costs have a negative effect on the number of game trips in all three leagues, while the effect of ticket price is mixed. The weighted consumer surplus per game trip includes travel costs and ticket prices; it is €418 for first division, €280 for second division, and €427 for third division clubs. Consumer surplus per game trip changes by €37 (league 1), €44 (league 2), and €69 (league 3) if the positive scenario occurred and by €8, €0.32, and €-35 if the negative scenario occurred.

Keywords: Contingent behaviour method; Travel cost method; Attendance demand; Consumer surplus; Bundesliga; Soccer

JEL classification: Z29, L83, R22, D61

1 Introduction

The German Bundesliga first division drew the largest attendance of any professional football league in the world in 2013-2014, averaging 42,600 per game (Deloitte, 2015). First division teams derived 20 percent of their revenues from gate receipts, while second division clubs received 19 percent (German Football League, 2015). Smaller clubs are more dependent on gate revenues than are larger clubs, which generate higher broadcast rights and player transfer fees. A full stadium improves financial performance and, perhaps, sporting success. A large crowd may improve the home team's play (Dewenter and Namini, 2013) and result in more favourable calls by the referees (Buraimo *et al*., 2010; Dohmen, 2008). Consequently, the determinants of football attendance have drawn the attention of scholars (e.g., Buraimo, 2008; Forrest and Simmons, 2002, 2006). While these studies have yielded insights into the effects of winning and other factors on ticket demand, none have attempted to estimate consumer surplus.

This paper examines attendance demand in the Bundesliga using a revealed and stated preference travel cost approach. While Whitehead *et al*. (2013) used this approach to estimate the effect of new arenas and team performance on consumer surplus in the National Hockey League (NHL), we ask how sporting success and management failure affect the demand for Bundesliga home games. During the 2013/2014 season, 7,105 fans and people living near 28 teams from the top three Bundesliga divisions answered online surveys. Applying the contingent behaviour method, respondents were presented with a positive and a negative scenario and asked for the number of games they would attend for each. The inclusion of ticket prices, travel costs, and time costs in the analysis allows for the estimation of the full consumer surplus.

2 Sporting success, travel costs, and attendance demand

Many researchers have studied attendance demand in football leagues, including the English Premier and Football Leagues (Forrest and Simmons, 2002), the Spanish Primera

Division (Garcia and Rodriguez, 2002), the Chinese Soccer League (Watanabe and Soebbing, 2015), the Finnish Football League (Iko and Heikkilä, 2010), the Scottish League (Jennett, 1984), and the German Football Bundesliga (Brandes *et al*., 2008; Czarnitzki and Stadtmann, 2002). Villar and Guerrero (2009) provided an overview of attendance demand studies across sports. A variety of factors influencing football attendance demand have been examined, including uncertainty of outcome (Forrest and Simmons, 2002); ticket prices (Garcia and Rodriguez, 2002); television broadcasts (Buraimo, 2008); advance ticket sales (Iko and Heikkilä, 2010); and star attraction (Brandes *et al*., 2008). Not surprisingly, team performance significantly affects attendance demand (e.g., Forrest and Simmons, 2002, 2006; Garcia and Rodriguez, 2002), but no previous football studies have examined how team performance affects the consumption benefits of attendees.

Likewise, travel costs have been largely neglected in attendance demand research, in contrast to studies of tourism demand. For example, travel cost studies have been conducted for sports fishing (Alberini *et al*., 2007), winter sports (Englin and Moeltner, 2004), natural sites (Hesseln *et al*., 2003; Loomis *et al*., 2001), and cultural experiences (Armbrecht, 2014). Three football studies have integrated travel costs into an attendance demand study. Forrest *et al*. (2002) used the zonal approach for estimating travel costs, which included ticket prices, various transport mode costs, and time costs. While their models were based on secondary data, their travel cost measures were based on survey responses of one club's fans. Similarly, Feehan *et al*. (2003) used a zonal travel cost approach when examining attendance demand based on fan survey data from the English Premiership. The models for all Premier League clubs revealed a significant negative effect of travel costs on the propensity to attend home games. Pawlowski and Anders (2012) computed travel costs based on ticket prices and distance travelled in their study on attendance demand in the Bundesliga; time costs were not considered. The effect of travel costs was significant and negative in all models.

A few studies have considered the distance between football teams, which is one component of travel costs. Some reported a negative effect for distance (Buraimo and Simmons, 2008; Garcia and Rodriguez, 2002), but did not include a squared term. Where distance squared was employed, previous studies found a u-shaped effect, i.e., a negative effect of distance and a positive effect of its squared term (Buraimo, 2008; Buraimo *et al*., 2009; Buraimo and Simmons, 2009; Forrest and Simmons, 2002, 2006). However, in the above studies, distance measures were not transformed into travel costs. While previous research has provided valuable insights on the determinants of attendance demand, none have been able to estimate consumer surplus. This paper does so through the contingent behaviour method.

3 Contingent behaviour method

Similar to the contingent valuation method (CVM) which has been widely applied in the context of professional team sports (e.g., Johnson *et al*., 2001; Wicker *et al*., 2015), the contingent behaviour method (CBM) can be used to collect stated preference data. While the CVM is used to estimate willingness-to-pay for non-market goods contingent on a hypothetical scenario (Carson, 2000), the CBM assesses behavioural changes contingent on a hypothetical scenario (Whitehead *et al*., 2013). It has been applied in both tourism economics (Alberini *et al*., 2007; Hesseln *et al*., 2003) and sports economics (Whitehead *et al*., 2013).

One advantage of the CBM is its flexibility. In some cases, data on actual behaviour and revealed preferences are not available. This is relevant to the present study: fans of clubs which have never been relegated or promoted may find it difficult to gauge their future demand for games. As with CVM (Johnson and Whitehead, 2012), hypothetical bias may be a concern in CBM. Hypothetical bias occurs if there is a significant difference between actual and hypothetical behaviour. Alberini *et al*. (2007) supported the validity of CBM data: the authors documented that actual and contingent behaviours are driven by the same demand

function. Mitigation approaches have been explored when hypothetical bias is found in CBM data (Whitehead *et al*., 2008, 2016).

CBM has only been rarely applied to sports attendance. Whitehead *et al*. (2013) examined the consumption benefits of NHL games contingent on the construction of new arenas for NHL teams in Edmonton and Calgary, Alberta. Revealed and stated preference data were collected for game trips. Travel costs are negatively associated with the number of game trips. Consumer surplus per game was about $50 for current attendees and $22 for non-attendees. Consumer surplus per season amounted to $261 for Flames fans attending an average of five games and $193 for Oilers fans attending four games. In hypothetical scenarios the additional consumer surplus for an additional place in the standings (e.g., first versus second place) per game would be between $2 and $8 for Flames and Oilers fans. The present study extends the use of CBM in sports by estimating consumption benefits from both sporting success and management failure in the Bundesliga.

4 Methods

4.1 Data collection

Between December 8, 2013 and March 25, 2014, 7,721 fans and people living in the region of 28 Bundesliga clubs completed online surveys (Wicker *et al*., 2015). The sample consisted of 13 first division (Nürnberg, Leverkusen, Dortmund, Mönchengladbach, Frankfurt, Augsburg, Bayern Munich, Schalke, Mainz, Berlin, Freiburg, Bremen, Stuttgart), seven second division clubs (Kaiserslautern, Cologne, St. Pauli, Düsseldorf, Karlsruhe, Paderborn, 1860 Munich), and eight third division clubs (Heidenheim, Saarbrücken, Duisburg, Muenster, Unterhaching, Regensburg, Darmstadt, Wiesbaden).

Links to the online surveys were published on various websites, including websites for teams, cities, fan clubs, local radio stations, fan forums, and social media sites. Posting the links through such varied channels facilitated the inclusion of diverse population groups in the sample. Survey participation was limited to people at least 16 years old. The survey provider

(soscisurvey) allowed for the completion of one online questionnaire per internet protocol address. Respondents providing implausible answers, being younger than 16 years, and living more than 1,000 km away from the club's stadium were dropped from the sample, leaving 7,105 observations.

4.2 Questionnaire and variables

A short introduction informed respondents about the purpose of the research, guaranteed anonymity and assured them that it was for scientific purposes only. A contact e-mail address was provided should participants have questions. Following some introductory questions on respondents' interest in football, they were asked how many Bundesliga home games they typically attend per season. German Cup and European games were excluded because the maximum number of home games is uncertain, making the stated preference questions too hard to answer.

In line with Whitehead *et al*. (2013), this study uses self-reported ticket prices. For season ticket holders, the per-game price was calculated as the season price divided by the number of games. Other attenders were asked how much they normally pay for a ticket. For attendees and non-attendees, the mean value of the self-reported prices of the respective clubs was used. Self-reported mean club prices show a strong, positive correlation with the actual ticket prices of the 28 clubs. Respondents were then asked how far they live from the stadium.

Afterwards, respondents were presented with two scenarios, positive and negative. The scenario order was randomised. In the positive scenario, their club hired a new player who would significantly improve the team's performance. For second and third division clubs, the result was promotion to the higher division. For first division clubs, the outcome was based on the clubs' recent performance to ensure that respondents considered the scenario realistic. Qualification for the UEFA Europa League was the hypothetical outcome for Nürnberg, Augsburg, Berlin, and Freiburg; qualification for the UEFA Champions League was chosen for Mönchengladbach, Frankfurt, Schalke, Mainz, Bremen, and Stuttgart; winning

the Bundesliga was selected for Leverkusen and Dortmund. For Bayern Munich – the winner of the 2013 UEFA Champions League – the only realistic scenario was winning the Champions League again because any other outcome would likely be considered a disappointment. The respondents were asked how many home games they would typically attend if the positive scenario occurred.

In the negative hypothetical scenario, the club has financial difficulties due to mismanagement, which can be problematic because clubs have to meet the licensing criteria of the German Football League. Respondents were informed that MSV Duisburg, for example, was relegated to a lower division before the 2013/2014 season because it did not meet the German Football League's financial licensing criteria. Relegation was the negative hypothetical outcome for all clubs except Bayern Munich, where not qualifying for the UEFA Champions League was the hypothetical scenario outcome. Management failure was considered a more realistic outcome than relegation due to poor sporting performance. Many Bundesliga clubs are prone to financial difficulties, typically because of overspending on player salaries (Barajas and Rodriguez, 2010) and governance failure which results in financial troubles even when revenues are increasing (Dietl and Franck, 2007).

Afterwards, respondents were asked how many home games they would typically attend if the negative scenario occurred. The end of the survey asked about respondents' socio-demographic characteristics, including age, gender, number of years living in the city, education, and income. Table 1 reports summary statistics for the variables used in this study.

Responses about monthly income and distance from the stadium were used to compute individual travel costs. Previous research sometimes includes ticket prices in travel cost models (Forrest *et al*., 2002; Pawlowski and Anders, 2012) and sometimes not (Whitehead *et al*., 2013). In line with the latter study – also using a combination of stated and revealed preference data – we report ticket prices separately. Travel costs include a monetary value for distance travelled and the opportunity costs of time. The travel allowance commonly used in

Germany is €0.30 per kilometre (Reisekostenpauschale [Travel cost allowance], 2015). Travel costs were computed using the following formula:

$$Travel\ cost\ =\ c\times 2\times D\ +\ ((\gamma\times M/h)\times(2\times D)/kph) \quad (1)$$

where c is operating cost per mile, D is one-way distance, $0 < \gamma < 1$, is the opportunity cost of time ($\gamma = 0.33$), M is monthly income, h is monthly hours worked ($h\ = 140$) and kph is driving speed ($kph = 100$).

4.3 Empirical analysis

The empirical analysis consists of four main steps. First, we checked the representativeness of the sample by comparing the structure of the sample with the German population. In our initial sample, the share of males is 76 percent and the average age is 32 years. The German population, in contrast, is 49 percent male and has an average age of 44 years (Federal Statistical Office, 2014). Two circumstances may explain the difference between the sample and the general population. First, since males and young people are more likely to participate in sport themselves (e.g., Downward and Rasciute, 2010), they may also be more interested in sport and more likely to self-select into sport-related surveys. Second, research shows that males and younger people use the Internet to a greater extent than females and older people (e.g., Servidio, 2014; Van Deursen *et al*., 2015). This implies that the online sampling strategy may have contributed to the overrepresentation of males and younger people in the sample. Such an overrepresentation is typical for sport-related online surveys (Wicker *et al.*, 2012, 2015). As a result, a weighted sample is used for the empirical analysis.

Second, the revealed and stated preference data are pooled to allow the estimation of the effects of sporting success (positive scenario) and management failure (negative scenario) on the number of home games attended. Pooling of data seems feasible since previous research shows that actual behaviour and contingent (hypothetical) behaviour are driven by the same demand function (Alberini *et al*., 2007; Whitehead *et al*., 2008). Thus, a three period pseudo-panel revealed and stated preference data set is created (n=7,105; t=3) where the

revealed preference status quo is period one and the two stated preference scenarios are the other two periods. This panel procedure has been applied in numerous other studies (e.g., Hesseln *et al*., 2003; Loomis *et al*., 2001, Whitehead *et al*., 2013).

Third, a travel cost demand model is estimated. The dependent variable is the number of game trips; it can only take non-negative and integer values. Because we have count data, a Poisson model was estimated. Given the pseudo-panel nature of the data after the pooling, a random effects Poisson demand model was preferred (Whitehead *et al*., 2013). The remaining variables from Table 1 are included as independent variables. Since the effects of sporting success and management failure may differ among the three Bundesliga divisions, a model is estimated for each league. Team dummies could not be included in the models because of collinearity with the ticket price variable. Since we elicit information on *typical* games attended, we are not able to test for hypothetical bias (Whitehead *et al*., 2013). An α-level of 0.1 is used for all statistical tests.

Fourth, consumer surplus estimates are obtained using the approach of Whitehead *et al*. (2013). Specifically, the consumer surplus *per game* is estimated as the negative inverse of the ticket price coefficient, while the consumer surplus *per trip* is estimated as the negative inverse of the travel cost coefficient. The consumer surplus per game trip is the expenditure weighted average of the consumer surplus per game and consumer surplus per trip.

5 Results and discussion

Table 1 gives the summary statistics for the weighted sample by league. Altogether, 40 percent (league 1) and 56 percent (league 2 and 3) of the respondents are male. On average, respondents of first division clubs are 46 years old, those of second division clubs 43 years and those of third division clubs 47 years. They have lived on average for 29 years (league 1), 25 years (league 2), and 29 years (league 3) in their current cities. The average monthly net income is slightly higher for respondents of second (M=2,048) and third division clubs

(*M*=2,095) than for first division clubs (*M*=1,886). The average years of schooling are similar across all three leagues.

Respondents living near first division clubs attend 5 games per season, while those living near second division teams attend 8, and those near third division clubs go to 7 games. Note that the third division, with 20 clubs, plays more games than the first and second division, which each have 18 clubs. In the positive scenario, respondents would attend about half a game more in league 1, and about 1.3 more games in leagues 2 and 3. In the negative scenario, fans in leagues 1 and 2 said they would continue their past behaviour, while fans of league 3 teams would cut attendance by about half a game. Mean ticket prices are on average higher for first division clubs (€26) compared with second (€19) and third division clubs (€12). Mean travel costs are higher for second division clubs (€51) than for first (€40) and third division clubs (€21).

Insert Table 1 here

Table 2 reports the results of the random effects Poisson models for each league. Ticket price has a statistically significant negative effect in the first division model, while it is positive and significant in the models for leagues 2 and 3. The negative effect is in line with previous research on attendance demand (Garcia and Rodriguez, 2002; Villar and Guerrero, 2009) and more generally with the law of demand. Whitehead *et al*. (2013) found the randomly varied stated preference ticket price had a significant negative effect on the number of game trips, while the revealed preference self-reported mean ticket price was positive but insignificant.

Why would ticket price be positively correlated with attendance demand in leagues 2 and 3? Perhaps, in these lower divisions, ticket price is a quality signal, i.e., better teams charge higher prices. For instance, teams relegated, especially for financial mismanagement, may indeed be more competitive than other teams in their new division. Moreover, recently relegated teams may still have first-division calibre players on the roster, particularly if they

want to be promoted again. If fans are loyal to their team, they may be willing to pay high prices to support the team's promotion efforts. Thus, the ticket price variable might be capturing a *fan loyalty effect* in leagues 2 and 3.

Travel cost has a statistically significant negative effect on home games attended in all three models. The higher the travel costs, including distance travelled and opportunity costs of time, the fewer trips to home games. This is in line with previous studies in tourism economics (Alberini *et al*., 2007; Chae *et al*., 2012; Englin and Moeltner, 2004) and attendance demand (Forrest *et al*., 2002; Pawlowski and Anders, 2012; Whitehead *et al*., 2013).

Turning to the scenario variables, the results of all three models indicate that respondents would attend approximately one more home game for each league. The results are highly significant. While the negative scenario does not have much effect in the models for clubs in league 1 and 2, it has a significant negative effect in the model for league 3. Recall that the negative scenario implied that clubs would be relegated to the lower division as a result of management failure. Third division clubs are relegated to the fourth division, or *regional league,* in Germany. While the third division is considered a professional sports league, the regional league is semi-professional. Most regional players are not professionals, but rather have unrelated employment or study in addition to playing football. The non-professional players and regional character of this league suggests that games are less attractive to watch, even for loyal fans.

Most socio-demographic variables are statistically significant in all three models. This differs from previous travel cost studies in tourism economics where socio-demographics were insignificant (Fleming and Cook, 2008; Nillesen *et al*., 2005). Similarly, many socio-demographic factors were insignificant in the ice hockey study by Whitehead *et al*. (2013). Income has a significant positive effect on game trips in all three models, an important finding because many other attendance studies have had to use income proxies such as employment

or regional per capita GDP (for an overview see Villar and Guerrero, 2009). Many other previous attendance demand studies excluded income.

The coefficient on age is negative and statistically significant in all three models. In all three models, males are significantly more likely to attend than females. People who have lived longer in the city attend significantly more games, while individuals with higher education tend to attend fewer games. The direction of the effects of age, gender, and educational level are in line with Whitehead *et al*. (2013), although only age was significant in their study. Our findings on age are consistent with Fuertjes (2013), who found that, while Bundesliga games attract all education levels, attendees are more likely to have lower or mid-level educational background.

Insert Table 2 here

Table 3 displays the consumer surplus estimates. While the consumer surplus *per game* (ticket price) is relatively low – it is negative for leagues 2 and 3, due to the positive ticket price coefficient – the consumer surplus *per trip* (travel costs) is substantially higher, particularly for first and third division clubs. The last row reports a weighted consumer surplus per game trip, i.e., a weighted average of the travel cost and ticket price variable. It is €418 for first division, €280 for second division, and €427 for third division teams. Interestingly, the weighted consumer surplus is highest for third division teams. Similarly, the change in weighted consumer surplus if the positive scenario occurred is higher for third division teams (€69) than for second (€44) and first division teams (€37). While the weighted consumer surplus for first and second division teams does not substantially change in the negative scenario, consumer surplus falls for third division teams.

Insert Table 3 here

6 Conclusion

The present research examines the effects of sporting success and management failure on the demand for home game trips in the German Bundesliga using a revealed and stated

preference travel cost approach. The application of the contingent behaviour method allowed for the estimation of private consumption benefits neglected in previous attendance demand studies. Moreover, the full consumer surplus is estimated since total travel costs, including ticket prices, distance travelled, and opportunity costs of time, are accounted for. Estimated consumer surplus per game trip varies across the three Bundesliga divisions, but is substantial.

This study adds to the body of research on attendance demand in a number of dimensions. It estimates consumer benefits rather than club benefits. Moreover, it investigates attendance demands in three divisions, rather than just the first. This extension of the literature is particularly relevant to European professional football and its promotion and relegation system. Possible extensions of this research include extending coverage to multiple seasons, to other countries, to other professional sports leagues, and to other hypothetical scenarios. For now, this study and Whitehead *et al*. (2013) are the only CBM travel cost studies of consumer benefits for professional sports leagues.

This research is not without limitations. First, we are not able to determine how football attendees got to the stadium since the mode of transport was not assessed in the survey. Thus, we were not able to include this information in our travel cost estimates – similar to previous research in the Bundesliga (Pawlowski and Anders, 2012). Second, this research is limited to one country and one type of sport. Future research should extend the present study design to other countries and leagues in other sports.

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