

## **Stadium attendance in German professional football – The (un)importance of uncertainty of outcome reconsidered**

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Abstract (200 words)

Although deeply ingrained in the economics of professional team sports literature, previous research could not confirm the importance of outcome uncertainty in European professional football. Moreover, a negative effect was detected and explained rather controversially: It is argued that the majority of spectators prefer to see the home team play either a much inferior team or a rather successful team. With data of  $n=306$  matches in the German Bundesliga, a generalized Tobit estimator with individual cut-off points and error terms clustered by home teams is employed to follow up with the discussion on the (un)importance of outcome uncertainty. The results highlight a significant positive effect on attendance when either the home and/or the away team still have a theoretical chance to win the championship while the suggested importance of teams still having the possibility to qualify for the UEFA Champions League is not supported (medium-term uncertainty). Furthermore, in line with previous research we could detect a negative effect of short-term uncertainty. However, while there is no evidence that spectators prefer the home team to play an inferior team, the results suggest that it is rather a strong brand of the away team which rises attendance figures in the German Bundesliga.

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## **The (un)importance of uncertainty of outcome reconsidered**

### **I. Introduction**

Sports economics has long since maintained an uncertainty of outcome hypothesis introduced by Rottenberg (1956) and Neale (1964). Since there is an increasing imbalance of European professional football leagues (Pawlowski *et al.*, 2010), the hypothesis suggests that this might have a negative impact on fans' interest, stadium attendance, and economic development of the leagues. However, the literature does not identify much support for the hypothesis. Moreover, the opposite effect was found arguing (although not tested directly) that the majority of spectators support the home team and therefore rather prefer to see their team play a much inferior team when winning being more probable (Buraimo & Simmons, 2008).

While it appears plausible that winning is important for any teams' fans, this assumption needs qualification in that high quality "big" clubs like Manchester United in the English Premier League or Bavaria Munich in the German Bundesliga as away-team opposition cause games to be sold out despite the fact that those clubs are (usually) supposed to have a greater chance to win than the home teams. Czarnitzki and Stadtmann (2002) thus argue that fans rather care about the reputation of clubs than the thrill of outcome uncertainty. However, reputation is measured as an index based on the final ranking of the clubs in the championship during the previous 20 years neglecting both, the possibility that fans might evaluate the sporting performance of teams

compared to their financial prospects differently and that there might be further important dimensions of attraction comprised in the club's image.

Consequently, this note tries to extend the existing research in three ways: First, we test directly whether spectators in the German Bundesliga predominantly prefer the home team to win. Second, we extend the reputation index employed by Czarnitzki and Stadtmann (2002) by focusing on the away teams' brand strength. This comprises both, the *perceived* sporting success and the *perceived* brand image. Third, because it is likely that the perception of fans has changed due to the increasing importance of European clubs' competitions, we control for both, the (*medium-term*) uncertainty of championship outcome as well as the probability of qualifying for the UEFA Champions League.

## II. Model

The logarithm of total match day attendance for the n=306 games played in the German first football division in the season 2005/06 serves as dependent variable in our model (*ATT*). The function estimated is of the form:<sup>1</sup>

$$\begin{aligned} \log(ATT_m) = & \beta_0 + \beta_1 * \log(HABIT_H) + \beta_2 * \log(HABIT_A) + \beta_3 * \log(COST) + \\ & \beta_4 * RAIN + \beta_5 * MATCHDAY + \beta_6 * MATCHDAY^2 + \beta_7 * PERF_H + \\ & \beta_8 * PERF_A + \beta_9 * UCS_H + \beta_{10} * UCS_A + \beta_{11} * UCL_H + \beta_{12} * UCL_A + \\ & \beta_{13} * (THEIL, FAVORITE, BRAND_A) + \varepsilon \end{aligned} \quad (1)$$

As noted elsewhere (Allan, 2004) the determinants of football attendance is a well documented area of economics. In line with recent research we control for habit

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<sup>1</sup> The choice of this season is explained with the availability of reliable brand strength values.

persistence of spectators considering home and away teams' previous season average match day attendance ( $HABIT_H$ ,  $HABIT_A$ ). Furthermore, we consider the costs of attending the match in the stadium which is approximated with the average ticket price and a travel cost component ( $COST$ ).<sup>2</sup> To cover possible opportunity costs a dummy is implemented ( $RAIN$ ) which measures if there was rain during the match day. Since we expect that people are more willing to attend a match at the beginning and at the end of the season<sup>3</sup>, the number of match days (squared) is included as well ( $MATCHDAY$ ,  $MATCHDAY^2$ ). Finally, current team performances are measured as the number of points scored in the previous five matches by the home and away team ( $PERF_H$ ,  $PERF_A$ ).

To consider the impact of *medium-term* uncertainty of outcome we employ a measure developed by Janssens and Késenne (1987) for both, home and away teams. The index is positive if the difference between points needed to win the championship in 2005/06 ( $c_{CS}$ ) and the number of points a team already gained ( $g$ ) is smaller than the difference between the maximum number of points a team can collect during the season ( $m$ ) and the maximum number of points a team could have collected until the certain match day ( $3t$ )<sup>4</sup>. The index is increasing with increasing (*medium-term*) uncertainty of outcome. In addition, a second (modified) index is included where  $c_{CL}$  denotes the points needed to qualify for the group stage of the UEFA Champions League in 2005/06:

$$UCS = \begin{cases} \frac{100}{c_{CS}-g}, & \text{if } c_{CS}-g \leq m-3t \\ 0 & \text{otherwise} \end{cases} ; \quad UCL = \begin{cases} \frac{100}{c_{CL}-g}, & \text{if } c_{CL}-g \leq m-3t \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

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<sup>2</sup> Following German income tax law (§ 9 Abs. 1, 4 EstG), travel costs are approximated with 30 Euro cents per kilometer between the home and away team.

<sup>3</sup> While we expect less attendance in the middle of the season (winter).

<sup>4</sup> Where  $t$  denotes the number of matches already played.

To consider the impact of *short-term* uncertainty of outcome the Theil (1967) measure is implemented (in model 1) where  $p_i$  reports the home team's winning probability, the away team's winning probability as well as the draw probability of a certain match based on unbiased betting odds provided by *betfair.com*. The index is increasing with increasing (*a priori*) uncertainty of match outcome.

$$THEIL = \sum_{i=1}^3 \frac{p_i}{\sum_{i=1}^3 p_i} \log\left(\frac{\sum_{i=1}^3 p_i}{p_i}\right) \quad (3)$$

Since previous findings suggest that the *THEIL* measure is negatively correlated with attendance, we control (in model 2) for the possibility that (the majority of) fans might rather prefer the home team to win with including a Dummy measuring if the home team's probability to win is greater than the away team's probability to win (*FAVORITE*).

Finally, we use away teams' brand strength values in model 3 (*BRAND<sub>A</sub>*) which had been derived by Feldmann (2007) based on an inquiry amongst n=2,812 individuals in football in 2005. Her theoretical model is validated applying a confirmatory factor analysis (CFA) and shows that *perceived* brand image and *perceived* sporting success are the key dimensions of football clubs' brand strength. Therefore, *BRAND<sub>A</sub>* considers both, the possibility that fans might evaluate a (let's say) fifth place of a financially strong team differently compared to a not that prosperous team and that teams with a rather bad sporting performance might nevertheless attract spectators due to a strong brand image.

Since more than 20% of the matches reached a 100% of capacity utilization indicating a latent demand, OLS estimates are not consistent.<sup>5</sup> Therefore, a generalized Tobit estimator with individual cut-off points is employed. Furthermore, since heteroscedasticity and unobserved heterogeneity between teams is expected, the standard errors are clustered by home teams.

### III. Results

As highlighted by the results in Table 1, the variables indicating whether home or away team still have the chance to win the championship ( $USC_H$ ,  $USC_A$ ) have a significant positive effect on attendance. However, of the two variables indicating whether a team still has possibilities to qualify for the UEFA Champions League in 2005/06 ( $UCL_H$ ,  $UCL_A$ ) only the variable for the away team is (weak) significant positive in two of the three models.

Furthermore, the significant negative effect of the *THEIL* measure in model 1 indicates that fans do not prefer matches that are (*a priori*) predicted to be close in score. Instead, these findings suggest that the less balanced a match is (*a priori*) the more spectators will come. This somehow contra-intuitive finding *cannot* be explained with the (majority of) fans preferring the home team play a much more inferior team since the variable *FAVORITE* (in model 2 and 3) is only weakly significant and negative. However, as indicated by the results of model 3, the brand strength of the away team ( $BRAND_A$ ) has a significant positive effect on attendance.

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<sup>5</sup> In the German Bundesliga there is not a security treatment like in the English Premier League (leaving 5% of all seats empty, see Buraimo & Simmons, 2008).

**Table 1. Parameter estimates of the generalised Tobit models clustered for home teams<sup>a</sup>**

	1. Model <i>THEIL</i>	2. Model <i>FAVORITE</i>	3. Model <i>FAVORITE + BRAND<sub>A</sub></i>
$\log(HABIT_H)$	0.763 (7.98)***	0.797 (7.98)***	0.791 (7.95)***
$\log(HABIT_A)$	0.195 (4.91)***	0.151 (3.91)***	0.124 (3.22)***
$\log(COST)$	-0.190 (-5.03)***	-0.176 (-4.16)***	-0.185 (-4.52)***
<i>RAIN</i>	0.057 (3.22)***	0.062 (3.37)***	0.057 (3.40)***
<i>MATCHDAY</i>	-0.024 (-3.78)***	-0.024 (-3.57)***	-0.022 (-3.66)***
<i>MATCHDAY</i> <sup>2</sup>	0.00088 (4.40)***	0.00090 (4.24)***	0.00084 (4.43)***
<i>PERF<sup>H</sup></i>	0.009 (1.41)	0.016 (2.12)**	0.014 (1.93)*
<i>PERF<sup>A</sup></i>	0.007 (1.32)	-0.0006 (-.12)	-0.004 (-.95)
<i>USC<sub>H</sub></i>	0.047 (3.75)***	0.065 (3.42)***	0.064 (3.47)***
<i>USC<sub>A</sub></i>	0.037 (3.90)***	0.033 (4.07)***	0.025 (4.19)***
<i>UCL<sub>H</sub></i>	-0.002 (-.77)	-0.001 (-.45)	-0.001 (-.037)
<i>UCL<sub>A</sub></i>	0.007 (1.80)*	0.006 (1.51)	0.006 (1.86)*
<i>THEIL</i>	-0.450 (-2.12)**		
<i>FOVORITE</i>		-0.075(-1.65)*	-0.012 (-.22)
<i>BRAND<sub>A</sub></i>			0.0053 (3.36)***
Const.	1.819 (1.67)*	1.384 (1.23)	1.531 (1.36)
LR	LR(13)=391 P>LR=0.000	LR(13)=383 P>LR=0.000	LR(14)=394 P>LR=0.000
$R^2_{MZ} * 100$	81.10	81.90	82.30
$n_{total}$	306	306	306
$n_{right-censored}$	63	63	63

Notes: <sup>a</sup> Numbers in parenthesis are *t*-values. \*  $\equiv p < 0.1$ , \*\*  $\equiv p < 0.05$ , \*\*\*  $\equiv p < 0.01$ .  $R^2_{MZ} \equiv$  McKelvey and Zavoina's  $R^2$ , LR  $\equiv$  Likelihood Ratio Test.

All control variables show the expected signs and are robust, i.e. their estimates have a similar magnitude in all three models: Both, the home and away team's previous season attendance (*HABIT<sub>H</sub>*, *HABIT<sub>A</sub>*), are significant positive indicating a habit persistence effect in attendance demand. Furthermore, the cost index (*COST*) is significant negative suggesting spectator sports to be a normal "product". In addition, attendance is minimized around match day 13 (*MATCHDAY*, *MATCHDAY*<sup>2</sup>) and the rain dummy (*RAIN*) is significant positive<sup>6</sup>. Finally, the current team performances appear to be of minor importance for stadium spectators in German professional football (only *PERF<sub>H</sub>* is weak significant positive).

<sup>6</sup> Since clubs in the German Bundesliga have access to modern stadiums with roofs suggesting that rain during the match must not necessarily make spectators feel uncomfortable it might be argued that people consider more leisure activities to be a substitute to attending a match if there is no rain on match day.

## IV. Conclusion

In contrast to previous research (Czarnitzki and Stadtmann, 2002) we could detect a significant positive effect on attendance demand when either the home and/or the away team still have a theoretical chance of winning the championship. However, the suggested importance of teams still having the possibility to qualify for the UEFA Champions League is not supported with the models.

In general, the negative coefficient of the *THEIL* measure causes some doubt on the relevance of the (*short-term*) outcome uncertainty which is in line with Czarnitzki and Stadtmann (2002) as well as Buraimo and Simmons (2008). However, this phenomenon cannot be explained by spectators preferring the home team play a much more inferior team. Moreover, it is rather a strong brand, i.e. a strong image and/or perceived sporting success, of the away team that increases attendance figures. Importantly, these findings are underpinned by estimated coefficients of the control variables that are broadly in line with previous research and robust to model specification.

The findings give some impetus for the current discussion in German professional football. It is argued that strong club brands are the leverage for televised football demand and therefore, the distribution of the media income in the Bundesliga should be based rather on the brand strength than on the absolute sportive performance of the teams (as it is currently done in Germany). Since this article is focused on stadium attendance, further investigations on the impact of strong brands on the demand for televised football are promising.

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