

The Quest for the Twelfth Man: Evidence from Italian Professional Soccer

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Abstract

Research Question and Aim of the Paper

We investigate the role of stadium attendance on team sporting performance by a cross-sectional study on Italian professional soccer for the season 2006/07 (observations for all teams in Serie A: 20, and Serie B: 22).

Theoretical Background

Home advantage effect has been widely investigated in the economics of sports literature, and the effect was detected for many sports (Schwartz and Barsky, 1977 [1]; Pollard, 1986 [2]; Neville and Holder, 1999 [3]; Smith, 2005 [4]; Wolfson et al., 2005 [5]; Dobson and Goddard, 2006 [6]). We focus on the attendance impact on home advantage.

Methodology and Research Design

The literature presents either a single demand equation or a single supply equation models. At first, we follow such usual treatment, so we present a demand model (see Table 1 for the explanation of the variables):

$$\begin{aligned} \log ATT_i = & \beta_0 c + \beta_1 \log WINS_HOME_i + \beta_2 \log AVPR_i + \beta_3 RIOT_i + \beta_4 ADDEDVAL_i + \beta_5 POP_i + \\ & + \beta_6 GOAL_i + \beta_7 DUMSERIEA_i + \beta_8 STAR_i + u_i \end{aligned} \quad (1)$$

List of variables for the demand model

Variables used in the demand model. Sources are reported in the second column. The nature of the variable and additional comments are reported in the third if needed. The last column report the expected average causal effect. All the data are referred to season 2006/2007 if not else specified.

Variables	Source	Comments	Expected relationship
<i>ATT</i>	<i>Almanacco del Calcio</i>	Dependant variable. It includes both season and game tickets' holder.	
<i>WINS_HOME</i>	<i>Almanacco del Calcio</i>	Regressor. Number of home wins.	(+)
<i>AVPR</i>	<i>Almanacco del Calcio</i>	Regressor. It is built dividing matchday revenues per attendance. This can results in endogeneity problem.	(-)
<i>RIOT</i>	<i>Almanacco del Calcio</i>	Regressor. It measures the fairness of home attendance. At the end of the season every team has a score that is higher if incidents happened during seasonal match. The methodology is not disclosed. We do not know if the score assigned also accounts for red and yellow cards received by players.	(-)
<i>ADDEDVAL</i>	<i>Osservatorio Economico Camera di Commercio</i>	Regressor. It is widely used in all the county economic growth indicators. It considers the county economic surplus.	(+)
<i>POP</i>	<i>Osservatorio Economico Camera di Commercio</i>	Regressor. Population at the end of year 2006. It measures market size.	(+)
<i>GOAL</i>	<i>Almanacco del Calcio</i>	Regressor. Goals scored by the team. It is included as a measure of attractiveness.	(+)
<i>DUMSERIEA</i>	<i>Almanacco del Calcio</i>	Regressor. It is 1 if the team plays in Serie A, 0 elsewhere. It checks if more advanced business practices are applied for serie A.	(+)
<i>STAR</i>	www.transfermarkt.de	Regressor. We count the number of players whose value is at least 5m € for serie A and at least 2.5m for serie B. The current value is considered.	(+)

and a supply model (see Table 2):

$$\log WINS_HOME_i = \gamma_0 C + \gamma_1 \log ATT + \gamma_2 CAP + \gamma_3 \log POINTS_ABROAD + \varepsilon_i \quad (2)$$

Table 2

List of variables for the supply model

Variables used in the supply model. Sources are reported in the second column. The nature of the variable and additional comments are reported in the third if needed. The last column report the expected average causal effect. All the data are referred to season 2006/2007 if not else specified.

Variables	Source	Comments	Expected relationship
<i>WINS_HOME</i>	<i>Almanacco del Calcio</i>	Dependant variable. Number of home wins.	
<i>ATT</i>	<i>Almanacco del Calcio</i>	Regressor. It includes both season and game tickets' holder.	(+)
<i>CAP</i>	<i>www.fussballtempel.net</i>	Regressor. Stadium number of seats.	(-)
<i>POINTS_ABROAD</i>	<i>Almanacco del Calcio</i>	Regressor. It is a proxy for team quality. It catches the overall strength of a team considering all the components of a good team and without distinction between players role and managerial role.	(+)

However, after dropping non significative variables from preceding regressions, we improve upon extant literature and present a model of demand and supply by running a two-stage least square (2SLS) regression because of the possible simultaneity caused by the interaction of the endogenous variable ATT. In fact, we included attendance also in the supply model in order to check for its impact on the soccer team production function. We estimate:

$$\log ATT_i = \beta_0 c + \beta_1 \log WINS_HOME_i + \beta_2 POP_i + \beta_3 DUMSERIEA + \beta_4 STAR + u_i \quad (1.a)$$

$$\log WINS_HOME_i = \gamma_0 C + \gamma_1 \log ATT + \gamma_3 \log POINTS_ABROAD + \varepsilon_i \quad (2.a)$$

Results

Results from single equation models support the idea that attendance plays a crucial role in home advantage.

On the other side, results from 2SLS on supply model do not support the general belief of the importance of attendance as soccer team production input: attendance played no role in the home team winning performance for the season 2006/07 for Italian soccer (see Table 3).

Table 3

Supply model estimation

Estimated model by two-stage least squares (2SLS), using EViews®. Instrumental variables are POP and DUMSERIEA.

Dependent Variable: LOG(WINS_HOME)

Sample: 1 42

Included observations: 42

White Heteroskedasticity-Consistent Standard Errors & Covariance

	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.200968	0.769495	-0.261168	0.7953
LOG(ATT)	0.063114	0.076063	0.829756	0.4117
LOG(POINTS_ABROAD)	0.527057	0.126388	4.170152	0.0002
R-squared	0.456415	Mean dependent var		2.124056
Adjusted R-squared	0.428539	S.D. dependent var		0.396241
S.E. of regression	0.299538	Sum squared resid		3.499206
F-statistic	14.88814	Durbin-Watson stat		1.466699
Prob(F-statistic)	0.000016	Second-Stage SSR		3.765652

Discussion

Our findings could have important consequences on soccer team marketing strategies. There is a profit maximization motive for ticket price fixing strategies. The results also explain and justify the trend towards the modernization of the stadium. Professional soccer teams could obtain a premium price by offering more comfort and additional services. A profit maximization motive for ticket price fixing strategies could also prove effective in tackling hooliganism. Clubs could apply different prices in order to attract desirable market segment. Social and educational role of the sport can be enhanced by corporate social responsibility strategies that allow the team to address specific action towards social relevant segments (low income family, disabled people, grassroots players).

References

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