ESTIMATING DETERMINANTS OF TELEVISION AND STADIUM REVENUES BY ITALIAN SOCCER COMPANIES

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INTRODUCTION

We present an empirical analysis on the determinants of television and stadium revenues for the Italian first division (Serie A). As for television, the contracts we consider were individually negotiated by each soccer company, effective for the three incoming seasons (2005-6, 2006-7, 2007-8), starting after the preceding contract ended on June 30, 2005. As for stadium, we concentrate on the season 2005-06.

METHODS

Due to space constraints the description of the variables is cursory. For television revenues, which is the more interesting case, we consider three alternative dependent variables: satellite television and foreign broadcasts (SAT0506), digital terrestrial television and ADSL internet (DTT5), cellular telephone (CELL5) and run regressions for each on a list of explanatory variables.

We distinguish in-site fans (attendance at stadium) from fans following the match on tv, and loyalty of fans is important to suggest them to subscribe with the broadcaster. The attractiveness of a team rests on its sport success, its winning (historical) streak and the spectacular event it can create. People go to the stadium to watch their team score and to watch a spectacular event.

Players want to play in attractive teams, their pay (WAGE5) depends on their ability and on the attractiveness of the team they play in: players want to win (not just being paid) so they want to be part of teams that can reasonably take part to the race to win the championship, so there is a two-way causality between wages and attractiveness of the team.

The general setting is the following (for example for satellite tv);

SAT0506	=	*f (attractiveness*, fans, loyalty*)*	(1)
WAGE5	=	*f (attractiveness)*	(2a)
FANBASE5	=	*f (fans)*	(2b)
RATIO	=	*f (loyalty)*	(2c)
HISTORY	=	*f (attractiveness)*	(2d)
ATTENDANCE	=	*f (attractiveness)*	(2e)
GOALS	=	*f (attractiveness)*	(2f)

Recall that in general causality can run either way in equations (2-). Asterisks in (1) indicate latent variables, all of the other variables in subsequent equations are indicators for those latent variables (Greene 2003: 87).

Data on revenues was very difficult to obtain, being considered proprietary, our sources gave us data which is near the true values, as they said. Data on wages is obtained from balance sheets and includes not only players' but all of the people paid. This implies that we face measurements errors, and that suggest an instrumental variables regression. We developed: i) FANBASE5 to measure *fans*; ii) HISTORY to consider the importance of sport success, so we count cups won and final position and presence in Serie A from 1954; iii) GOALS, which are goals done by the team in that season, as if the fans were constantly updating their estimation on the ability of their team to score (rational expectation). The variable RATIO equals the ratio between seasonal tickets and game tickets: we use loyalty of in-site fans as representing overall loyalty of fans for that team, ATTENDANCE is presence at stadium in the whole season. Many interesting variables

were excluded from our previous list, among which, most notably, media coverage, of which we had too sparse data.

RESULT

We run a two stage least square (2SLS) with WAGE5 as an endogenous regressor, FANBASE5 and RATIO as included exogenous regressors, and HISTORY, ATTENDANCE, GOALS as instrumental variables (we did not include POINTS as an i.v. due to correlation with GOALS). As a functional form we tried additive model and a log-log model for SAT0506, and choose the one with significative results for DTT5 and CELL5. Here are the results for satellite television (additive):

$$(\hat{SAT0506}) = 2371926 + 0.379191 \; WAGE5 + 3.051507 \; FANBASE5 + 112457.2 \; RATIO$$
$$(671043) \quad\quad (0.029425) \quad\quad\quad (0.590734) \quad\quad\quad\quad (48059.65)$$

Adj-R^2 = 0.993484, F-statistic = 948.3176 (p=0)

All of the regressors are significant at 5% level, (std errors in parenthesis). Here are the results for digital terrestrial television:

$$(\hat{DTT5}) = 752627.3 + 0.015773 \; WAGE5$$
$$(135022.1) \quad\quad (0.002341)$$

Adj-R^2 = 0.721705, F-statistic = 45.39938 (p=0). All of the regressors are significant at 5% level, (std errors in parenthesis). Note that FANBASE5 and RATIO have been excluded because they were not significant as included exogenous variables; the other variables keep their role.

Here are the results for cellular phones:

$$(\hat{CELL5}) = 0.025241 \; WAGE5 + 0.629234 \; FANBASE5$$
$$(0.012062) \quad\quad\quad (0.629234)$$

Adj-R^2 = 0.873652. All of the regressors are significant at 5% level, (std errors in parenthesis). Note that there is not a constant term (C) in the last two regressions because it appeared not significant and with a negative sign, and RATIO has been excluded because it was not significant when present as an included exogenous variable; the other variables keep their role.

For stadium revenues the dependent variable is STADIUMREV and we used 2SLS with the same variables (except RATIO), now using ATTENDANCE instead of FANBASE5 as included exogenous variable. As instrumental variables we used HISTORY and GOALS (we also used POINTS as a substitute to GOALS, and the results do not substantially change).

$$(\hat{STADIUMREV}) = 0.038127 \; WAGE5 + 13.98202 \; ATTENDANCE$$
$$(0.013428) \quad\quad\quad (1.413240)$$

We estimated a form of Cobb-Douglas production function, with "quantity" expressed as POINTS gained at the end of the season or with end-of-season rank as a dependent variable (H0506), calculated the same way as HISTORY.

DISCUSSION

For television our results apply to the actual setting of individual negotiation: each company contracts with the broadcaster. This will presumably change in the near future, in fact a new Bill in discussion at the Italian Parliament will switch to a centralized negotiation by Lega Calcio (Italian League). Nevertheless, we think our results are useful, not only to shed a light on the determinants of television revenues but also to answer over the

relative importance of teams, even in a setting of collective negotiation of television revenues.

The accuracy of our estimation could be ameliorated if we had actual data on revenues from television and telephone companies and a more precise account of wages paid to players.

For stadium revenues, our analysis should include cultural and social variables explaining the attractiveness of going to see the game at the stadium. Finally, to have a full picture, we should include revenues from merchandising and licensing, we think the same regression as for satellite television could explain the relationship.

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