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Goal! Profit maximization and win maximization in football leagues

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Abstract

In this paper we estimate the best responses of football clubs to the choices of other clubs in Spanish and English leagues over the period 1994-2004. We find that choices are more closely approximated by win maximization than by profit maximization in both the short term and the long term. We examine club characteristics that might explain variations in choices between Spanish clubs.

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1. Introduction

After many decades of debate within the economics profession and outside, the profit maximisation hypothesis remains controversial. Few today would argue that profit maximization is a literal description of what *all* managers in firms pursue. In a world where some managers may maximize profits and other may not, debate is largely focused on arguments associated with natural selection. Going back as far as Alchian (1950), some economists have argued that firms in which decision making most closely resemble profit maximizing decisions will be more likely to survive, and hence we can safely assume that industry outcomes are consistent with profit maximization, regardless of the actual motives of individual managers.

Because intentions may no longer matter, natural selection arguments are often hard to rebut. The idea that natural selection favours profit maximization has been widely challenged, perhaps most notably by Nelson and Winter (1982). Theoretically, Dutta and Radner (1999) show that profit maximization leads to certain bankruptcy of the firm, while alternative strategies have a positive probability of long-term survival. However, this is in the context of a specific general equilibrium model, and different general equilibrium models might produce different results. There is plenty of evidence that animals such as hummingbirds employ close to optimal strategies when searching for food, and evolutionary biologists attribute the prevalence of optimal foraging to natural selection (e.g. MacArthur and Pianka (1966)). There is also plenty of evidence from experimental economics showing that many, if not most, individuals do not select profit maximizing strategies (see e.g. Rubinstein (2006)). However, experimental results may not give an accurate reflection of how people behave in "real world" contexts, and natural selection may still favour profit maximizers, even if they are in a minority.

Empirical work on profit maximizing choices tends to be restricted to a narrow range of settings where it is feasible to infer behaviour from choices. Examples include bidding in electricity markets (e.g. Hortacsu and Puller (2004)), and the wine industry (Scott Morton and Podolny (2002)). The advantage of these settings is that profit-maximizing strategies can be identified and choices can be evaluated against this benchmark. In this paper we examine player expenditure choices by football clubs in

Spain and England. Given the structure of competitive interaction in a football league, we are able to identify profit-maximizing best responses to the choices of other teams in the league. We find that actual choices differ significantly from this benchmark, and that the behaviour of clubs can be better understood by a strategy of win maximisation subject to a budget constraint. We explore reasons that might explain this strategic bias, and find evidence to support the idea that football club executives may find it in their best interests to pursue this strategy. Hence, in this market, selection may favour win maximizers over profit maximizers.

2. Testing profit maximization and sports leagues

Sports leagues are often thought of as natural testing grounds for many theories (see e.g. Kahn (2000)). One reason is the ready availability on performance and productivity, another is that the strategy space can usually be very clearly defined given the known structure of the game. Testing for mixed strategies in tennis (Walker and Wooders (2001)) and penalty taking in football (Chiappori et al. (2002) and Palacios-Huerta (2003)) are perhaps two of the best known examples that confirm behaviour consistent with maximizing choices by contestants. By contrast, Romer (2006) examined the choices of American football coaches and found that they were systematically inconsistent with maximizing behaviour.

Deciding whether teams in leagues maximize profits, however, is more important than simply corroborating economic arguments about natural selection. Professional sports leagues are unique in the sense that the competitors on the field engage in economic cooperation off the field. Teams cooperate to agree the rules of the game, but in practice go much further than this, engaging in labour market restraints (e.g. rules on the allocation of players, roster limits, salary caps) and product market restraints (e.g. exclusive territories, revenue sharing, collective selling) whenever they are permitted to do so by the competition authorities (for a review of such practices and their legal treatment see Szymanski (2003)). Many economists have argued that these restraints do little more than raise profitability when engaged in by profit maximizers (e.g. Fort and Quirk (1995), Vrooman (1995)). However, following from the earlier work of Sloane (1971), Kesenne (1996, 2000) has argued that, in the world of European football, clubs can be treated as win maximizers (subject to a profit constraint) rather

than profit maximizers, leading to different conclusions about competitive restraints. For example, if profit maximizers share gate revenues, the incentive to invest in players is diminished, since each team receives a smaller marginal return on its own investment. If win maximizers share revenues, spending incentives are not affected, since teams are expected to spend everything they receive. Thus the nature of objectives has significant implications for policy prescriptions.

American economists have expressed some scepticism about the feasibility of identifying whether teams are profit maximizers. Fort and Quirk (2004) suggest that without detailed information on revenue functions it is hard to make comparisons about profit or win maximizing choices, while Zimbalist (2003a) find little convincing evidence distinguishing profit maximizing behaviour from any other, and concludes that "owners maximize global, long-term returns" (p510). However, some empirical studies exist. Atkinson et al (1988) found that wage rates for players in the NFL exceeded their estimates of marginal revenue products, and concluded that owners were pursuing utility maximizing rather than profit maximizing strategies. Ferguson et al (1991) tested ticket-pricing behaviour in the NHL and found that choices were consistent with profit maximization.

Our approach is to start by estimating a statistical model of revenues and costs for teams in the top two divisions of Spain's Liga National de Fútbol Profesional (LFP) and the top two divisions of the English leagues (the FA Premier League and the top division of the Football League, currently known as The Championship). There is a well-established relationship in football leagues between team success and player spending, and between team success and team revenues (see e.g. Szymanski and Smith (1997) and Forrest and Simmons (2002)). As is natural in a competitive environment, these relationships depend in part upon the choices of the other teams in the league. They also imply that there exists an expected level of profitability for any given league position achieved by a team, conditional on the choices of all the other teams. We are thus able to test whether the choices of each team are closer to best responses implied by profit maximization or by win maximization. We find consistent evidence of win maximizing behaviour in both the Spanish and the English leagues. We then examine factors that might account for differences in behaviour between Spanish clubs. These can be separated into factors connected with the history and

organisational structure of the teams, and factors connected to the background of the current club presidents. We find that teams that have been more successful in the league historically tend to be more oriented toward profit maximisation rather than win maximisation, as are clubs where the share capital is more closely controlled. The industry background of the club president also matters. In particular, club presidents from the construction industry are notably more oriented toward winning. This may be associated with an increased likelihood of gaining planning permission for local construction projects when the local football club is doing well.

The rest of the paper is structured as follows. In the next section we provide some background information on the leagues and clubs, and discuss the data. Section 4 presents our theoretical framework and section 5 reports the results of the analysis relating league position to wages and revenues. Section 6 discusses the implications for profit and win maximisation and looks at the factors explaining variations in objectives. Section 7 concludes.

3. The Spanish and English Professional Football Leagues.

The English Football League was founded in 1888 as a competition among elite clubs that employed professional players. About this time most of the member "clubs" transformed themselves into limited liability companies. Under English law such a company must issue share capital and set down its broad objectives in the articles of association. It must appoint a board of directors to manage the day to day business. By 1922 there were 88 clubs that belonged to the Football League, organised into four divisions, connected via the institution of promotion and relegation. Under this system the worst performing teams in any division, measured by points won in competition, are replaced automatically at the end of the season by the best performing teams in the immediately junior division (see Noll (2002) and Szymanski and Valletti (2005) for an economic analysis of this system). Membership of this structure has been remarkably stable, and almost all of the 88 clubs are still participants today. In 1992 the top division formally separated itself to become the FA Premier League (FAPL), primarily so that the biggest clubs could retain control of TV broadcast income. However, the promotion and relegation system has been preserved intact, and each team in the FAPL owns one share, on the understanding that a relegated team

surrenders its share and passes it on to a promoted team. The development of TV broadcasting has dramatically enlarged the inequalities between teams in different divisions (see e.g. Szymanski (2001)), so that the economic consequences of relegation from the FAPL are dramatic.

League football started in Spain in 1927, and the dominant league today is the Liga National de Fútbol Profesional (LFP) which consists of two divisions of 42 teams (20 in the top division and 22 in the second).[3] Since its inception league football in Spain has been dominated by three clubs and by politics. The three clubs are Real Madrid, Barcelona and Athletic de Bilbao and the political issues concerned the relationship between the Castilian majority, the Catalans and the Basques, whom each team is frequently deemed to represent. The political significance of these teams was further enhanced during the Franco era. During the 1950s and 60s Real Madrid dominated European football and was one of the first teams to adopt a policy of hiring international stars. During this era support for a football team was perceived to be one of the few ways of openly expressly opposition to the nationalist regime, and games between Barcelona or Athletic de Bilbao and Real Madrid were of great political significance. Following the death of Franco, the adoption of democracy, decentralization and entry into the European Union, football has been, to a degree, depoliticised, but traditional rivalries remain.

Traditionally the Spanish football clubs were also "clubs" in a legal sense, with members who pay an annual subscription and a club committee elected by the members for a term of office (usually 4 years). These clubs were typically "multi-sport" organisations, running teams in basketball and other sports as well as football, and providing facilities for members to play as well as watch sport. Frequently they would also receive subsidies from local government which saw them as providing a service to the community. During the 1980s most of these clubs ran up large financial deficits, mostly as a result of hiring expensive players for the football team. To address this financial crisis the government passed a law in 1992 obliging them to adopt the status of Sociedad Anonima Deportiva (SAD). An SAD is essentially a limited company, with all the associated obligations, but with some special

[3] Seasons 1996 and 1997 had 22 teams in the First division and 20 in the Second division of the LFP.

concessions for their sporting status. The principal purpose of the reform was to force the clubs to behave like ordinary businesses and balance their books (see e.g. Ascari and Gagnepain (2006)). The clubs did not want to do this, preferring a soft budget constraint on the theory that the local authority would never be able to close them down and that their deficits would always be covered out of public funds; however the government made acceptance of SAD status a condition for bailing out the clubs. Four clubs (Barcelona, Real Madrid, Athletic de Bilbao and Osasuna), having fulfilled some demanding financial requirements, were able to persuade the government to exempt them from the reform and hence continue to this day under their traditional club structure. Within the traditional structure the role of the elected president has always shaped the development of the football club. During elections candidates make promises about their plans to invest in attracting players, often using their own financial resources.

Data on English football is plentiful thanks the peculiarity of British accounting laws which requires all limited companies to lodge annual accounts for public inspection. Moreover, since English football clubs, unlike major league teams in America, have never been absorbed into larger corporations (although the acquisition of Manchester United by the Glazer family in 2005 may start a trend), then income statements accurately reflect both income from team activities and expenditure on players. Since 1994 the accounting form Deloitte's has published this data annually and this has become the standard data source; data prior to this was assembled by Szymanski and published in Szymanski and Kuypers (1999). Since Spanish clubs adopted SAD status financial data has also become available for most of the Spanish clubs. Hence we restrict our analysis to the period 1994-2004 for which we have data.

There has been much talk in recent years of a financial crisis in European football caused by excessive spending on players.[4] To set this in context, Table 1 and Figure 1 show the aggregate operating profits of clubs in the "big 5" leagues. Only the English and German leagues consistently report an operating profit, while the Italian, French and Spanish league report deficits. In general this data needs to be interpreted with caution. American major leagues have tended to report accounting deficits, while

[4] For a country by country discussion see the special edition of the Journal of Sports Economics, 2006.

economists on inspection have identified way in which economic profits are concealed (see e.g. Quirk and Fort (1992) and Zimbalist (2003b)). Nonetheless, it is reasonable to suppose that the promotion and relegation system, absent from the US major leagues, places additional pressure on the clubs to spend on players.[5]

[insert Table 1 and Figure 1]

Table 2 presents some data on average revenues and spending by division in England and Spain. What stands out from this table is the extraordinary increase in income and spending over the period- around five-fold in England and nearly fifteen-fold in Spain between 1994 and 2004. This reflects the explosion of broadcast rights values associated with increased competition in the broadcasting industry and the advent of new technologies. The table also shows that on average teams have tended to spend a relatively stable share of total revenue on players - in the top Spanish division the average is 62% and for the Premier League the average is 53%. For the Spanish second tier the average is 93% and for England is 76%. Both revenue and wage expenditure are somewhat higher in the English leagues, but the difference is not huge.

[insert Table 2]

4. The sensitivity of revenue to performance and performance to wages.

Competition in a sports league is essentially a kind of Tullock contest. Fans generate revenues, and they are typically attracted by the success of a team. Thus teams which achieve high league positions tend to attract more income. Successful teams are the ones that have the best players. In a sense this is tautologous, since the teams that win are usually defined to be the best, but market for players creates a behavioural link. Teams compete to hire players, and players sell their services in a market (prior to 1995 there existed some restrictions on cross border transfers, but the 1995 Bosman judgment of the European Court of Justice upheld the right of players to move freely between clubs in the European Union). Hence it is not surprising if we observe the best players tend to command the highest wages. The importance of the insight from contest theory is that it is not absolute spending that determines performance, but

[5] For a comparison of the closed American league system and the open European system see Hoehn and Szymanski (1999).

spending relative to one's rivals. For example, in 1994 an average performance in the top Spanish league could be achieved by the average spending level, which was €3.1 million. To achieve the same average performance in 2004 required a wage spend of €37.1 million. Of course, this is not an auction where the highest bidder wins with probability one. Luck, particularly in relation to injuries to star players, plays a significant role, so the biggest spending team does not always win. Moreover, factors other than performance may affect revenues (as shown by Garcia-del Barrio and Pujol, 2006) and factors other than wages may affect performance. This is primarily an empirical issue.

Our theoretical model (following Szymanski and Smith (1997)) is based around a revenue equation and a wage equation. The revenue equation can be defined as

$$\ln\left(\frac{R_{it}}{\overline{R}_t}\right) = \alpha + \beta_i + \gamma \cdot \ln\left(\frac{43 - P_{it}}{P_{it}}\right) \quad (1)$$

Where R_{it} is the revenue of club i in season t, and $\overline{R}_t$ is the average revenue of the clubs in the league in season t. This is assumed to depend on a club specific fixed effect (which may reflect the history of the club) and the log odds of league position P_{it} achieved in the season.[6] The odds transformation works particularly well since the implication is that there are increasing returns to performance when team position is below the league average and decreasing returns when team position is above the league average. In this paper we use league position as the measure of performance. In studies of competition in American leagues the convention is to use win percentage, but in fact the correlation between win percentage and league position is typically greater than 0.9. Our performance equation is

$$\ln\left(\frac{43 - P_{it}}{P_{it}}\right) = a + b_i + c \cdot \ln\left(\frac{W_{it}}{\overline{W}_t}\right) \quad (2)$$

[6] Note that we treat position as a continuous variable and rank positions in the second divisions as if they were a continuation of the top divisions. For example, we give the rank 21 to first place in the Spanish second division, 22 to the second place and so on.

Where W_{it} is the wage expenditure of club i in season t, and again we allow club specific fixed effects. Clubs also spend considerable sums of money on transfers fees, but in general a club's net transfer spending is small relative to its total wage bill. Moreover, net transfer spending relates to long term investment in players rather than expenditures on the current season, and for this reason tends to be poorly correlated with team success.[7]

Using equations (1) and (2) we can define profits as function of league position, average wage expenditure, average club revenues and the exogenous parameters:

$$\pi(P_{it}) = \overline{R_t}\left(\frac{43 - P_{it}}{P_{it}}\right)^{\gamma} e^{\alpha+\beta_i} - \overline{W_t}\left(\frac{43 - P_{it}}{P_{it}}\right)^{\frac{1}{c}} e^{-\frac{a+b_i}{c}} - F + I \tag{3}$$

We here treat position a choice variable although, absent match fixing, this is not possible. It is more natural to think of teams choosing wage expenditure but in this model it is in fact equivalent. Thus, for given expenditure and revenues for rival teams, there is a unique level of wage expenditure associated with each possible league position. Maximizing with respect to P_{it} we can identify the profit maximizing performance for the team:

$$P_{it}^{*} = \frac{43}{1 + \exp\left(-\frac{a + b_i + c(\alpha + \beta_i) + c\ln\overline{R_t} - c\ln\overline{W_t} + c\ln(c\gamma)}{c\gamma - 1}\right)} \tag{4}$$

We approximate the win maximizing position as one where variable income from league performance equals variable cost. If we assume there is a zero budget constraint this is equivalent to assuming F=I. This may overstate the win maximizing expenditure relative to the profit maximizing level, but for given parameters the profit

[7] It might be argued that both equations (1) and (2) could be subject to reverse causation. For equation (1) it might be argued that revenue can cause success, but this in turn must depend on what the revenues are spent on. Equation (2) measures this effect through wage spending, but it could be argued that other factors, such as stadium size and quality can cause better performance of the team at the home ground. However, as the empirical results below will show, wage spending is far and away the single most important factor in determining league performance. Could league performance cause wage spending? If teams pay bonuses for winning then causation can run in the opposite direction, but in fact performance bonuses are relatively small, since competition among the clubs to hire the best players typically leads them to offer high fixed wage contracts. Hall et al. (2002) considered the hypothesis of reverse causation in English football and found no evidence to support it.

maximizing position will always be lower. In our formulation the win maximizing choice of position is given by

$$\hat{P}_{it} = \frac{43}{1+\exp\left(-\frac{a+b_i+c(\alpha+\beta_i)+c\ln\overline{R_t}-c\ln\overline{W_t}}{c\gamma-1}\right)} \quad (5)$$

The model may be thought of as a reduced form contest model, where some theoretical constraints are ignored. First, we do not impose an adding up constraint to ensure that the sum of league positions won must equal the actual sum of league positions available. Second, we do not impose any constraints to ensure that the average revenues (wages) of teams in the league equal the sum of profit or win maximizing revenues (wages). Thus equations (4) and (5) can be thought of a "best responses" to the choices of other clubs, and we seek to identify whether the actual choices of teams tended on average to be closer to their profit or their win maximizing best response. However, even if each team chose its best response (according to its objectives), this set of choices might not constitute an equilibrium since we do not consider the possibility of entry. Entry in the European league format would involve teams from junior leagues bidding up wages to gain entry and thus dissipating profits. Note that entry would be likely to change parameter values such as b_i and β_i since new teams would attract fans and players not just on the basis of their success but also because of their proximity. The equilibrium properties of the model are discussed further in the appendix.

5. Estimation

The focus of our interest is in the best response of teams to the choices of their rivals. We now define the model in dynamic form in order to distinguish between short run and long run best responses. Thus, the empirical analogue of equation (1) is

$$\ln\left(\frac{R_{it}}{\overline{R}_t}\right) = \alpha+\beta_i+\gamma\cdot\ln\left(\frac{43-P_{it}}{P_{it}}\right)+\delta\cdot\ln\left(\frac{R_{it-1}}{\overline{R}_{t-1}}\right)+\varepsilon_{it} \quad (6)$$

Where allow lagged revenues to influence current revenues and assume a white noise error term. We report our estimates in Table 3.

[Insert Table 3]

We estimate three versions of the model, OLS with robust standard errors (1), the fixed effects estimator (2) and the IV fixed effects estimator (3).[8] Our estimates are based in Spanish and English club data over the period 1994 to 2004. The similarities in terms of magnitudes and significance are striking.[9] Moreover, the explanatory power of the regressions is very high. However, since league competition is run according to rules laid down by the international governing bodies (UEFA and FIFA), and given that the players sell themselves in what is essentially a single European market, the similarities are perhaps not so surprising as they seem at first. In any case this gives us some confidence that the same competitive forces are at work in each league and that we can make meaningful comparisons across leagues.

The empirical analogue to equation (2) is

$$\ln\left(\frac{43-P_{it}}{P_{it}}\right)=a+b_i+c\cdot\ln\left(\frac{W_{it}}{\overline{W}_t}\right)+d\cdot\ln\left(\frac{43-P_{it-1}}{P_{it-1}}\right)+u_{it} \tag{7}$$

Our estimates are reported in Table 4 which is structured similarly to Table 3.

[insert Table 4]

Again, we find a remarkable degree of consonance between the results for the two leagues and a very high level of explanatory power. We conclude this section by observing that the business of football seems relatively easy to understand: performance generates revenue and wages generate performance. Beyond these two relationships, there is relatively little scope for clubs or managers to influence outcomes.

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[8] In model (2) the lag of the dependent variable is directly used as a regresor. Column (3) is estimated using the instrumental variables approach. This technique is prescribed in the presence of fixed effects, to avoid the systematic multicollinearity between the element of individual heterogeneity (which does not change along with time) and the lagged dependent variable. In particular, as an instrument for the lagged logarithm of the relative revenues we use the lagged relative wages. The multicollinearity provokes inefficiency and possibly bias in the estimations. For the instruments to be suitable, they must be highly correlated with the instrumented variable while not presenting multicollinearity either with other regressors or with the error term. The latter condition is at best dubious in our case, but no better instruments were available.

[9] The results for England are also similar to those report by Szymanski and Smith for the period 1974-1989.

5. Profit-maximizing and win maximizing behaviour

We now use the fixed effect estimates (column (2)) to identify the league position that each team would have achieved had it chosen either a profit maximizing or win maximizing best response to the choices of the other teams. In any given season a team might find itself a long way from its best response due to good or bad luck (e.g. injuries). Thus we focus on the average best responses over the sample period for each team and compare with the average league position actually achieved. First we consider the *short run* best responses, i.e. taking lagged values as given. The results for each team are reported in Table 5.

[insert Table 5]

By inspection it is apparent that teams in the both the Spanish and English leagues are relatively close to their win maximizing positions. Note that there is a high correlation between the actual positions, win maximizing positions and profit maximizing positions, so that both assumptions work well in terms of the ranking of teams. However, the win maximizing model works much better in terms of the actual positions achieved, as shown in Table 6.

[insert Table 6]

On average, the Spanish teams were 12 places *above* their short-run profit maximizing position over the sample period, but less than half a place *below* their short-run win maximizing position. Similarly, the English teams are nearly 16 places *above* their short-run profit maximizing position, but less nearly four places *below* their short-run win maximizing position. Note that for each club, these positions represent a best response, given the choices of the other clubs. Clearly, if the other clubs had made different choices, then the best response would also have been different. Thus one cannot interpret these positions as equilibrium choices- to do that would require all clubs simultaneously to be choosing their best response.

Of course, profit maximisation and win maximization subject to a zero profit constraint are just two points along a spectrum of possible objectives. Clearly, however, the evidence suggests that the behaviour of clubs in our sample conforms quite closely to short run win maximization.

Long run profit or win maximisation takes account of the dynamic effects of current success on future success. Our estimates of the long run league positions associated with profit maximisation and win maximization are relegated to the appendix, as they do not significantly differ from the short run estimates, in the sense that the win maximising position is in general substantially higher than the profit maximizing position. The main difference is that the long run profit maximizing positions are somewhat higher on average than short run profit maximizing positions, but still well below the win maximizing positions, which remain almost identical on average to the actual positions. The second difference is that the variance of positions is greater, since strong teams tend to benefit from dynamic effects while weaker teams do not. The extent to which club behaviour is best approximated by long run or short run considerations is itself an interesting question for debate. However, in the context of comparing profit and win maximizing choices of the clubs in our data set, the two alternatives do not make much difference.[10]

6. Explaining deviations from profit maximisation

We now try to account for deviations from profit maximization in the Spanish league. We do so by constructing a variable (LeagPositPurch) which is the number of positions higher than the profit maximizing level that are purchased by the team. We conjecture that the willingness of clubs to buy positions will be influenced by the following factors:

a) The historical status of the club and the expectations of fans
b) The legal status of the team (whether the team has SAD or "club" status)
c) The motivations of the senior executives
d) The concentration of the control in the decision making of the club
e) The threat of relegation

[10] The long run estimates for the English clubs suggest that their actual behaviour lies mid-way between pure profit maximization and win maximization subject to a zero budget constraint. One interpretation of this is that teams maximize wins but have a budget constraint significantly higher than zero. However, our findings still indicate that they are a long way from pure profit maximization.

Our variables are described fully in Table 7. We measure historical status by the sporting success of the team in the league in the years prior to our sample. While all club presidents want their team to win, it is possible that their commitment to winning may be affected by their background, and so we use information on the business sector from which club presidents originate. We also allow for the possible effect of the concentration of share ownership in the SAD's. Finally, relegation threats often provoke increased spending on success, so that teams which persistently find themselves in the relegation zone are likely to spend up to their financial limits.

[insert Table 7]

We estimate the model for both the two Spanish divisions combined and for the first division alone. The results are broadly similar, although the coefficient on the second division dummy in the combined model suggests that second division teams are less likely to overspend on talent and winning. Instead, they are closer to their profit maximizing position than first division teams, which may reflect either a natural sorting of teams by ambition or tighter budget constraints for poor performing teams (since deficits cannot forever be justified by glory).[11]

Perhaps the most interesting result is that the historical status variable is negative rather than positive, suggesting that past performance is a substitute for current performance. This makes some sense, since teams that have never experienced success may become desperate to meet the demand of the fans. We also find that teams facing relegation risk tend to increase their spending relative to the profit maximizing position. The fact that teams struggling for promotion or against relegation display a more substantial willingness to "buy" performance improvements is quite intuitive.

We now turn to the legal and institutional factors. Note that the coefficients of the dummy variables can be interpreted as the number of places nearer to or further away from profit maximization that are implied by a given status. The dummy variable for

[11] For the position variable smaller numbers mean higher (better) league positions. Hence when the deviation of the profit maximizing decision from the actual position (our dependent variable) is positive then the club has higher league position than predicted by profit maximization. A positive regression coefficient is thus associated with better than profit maximizing league performance.

"club" status is negative, which does not support the government's view that the regulations would impose tighter financial constraints on clubs; however, the coefficient is a long way from statistical significance. We included a separate dummy variable for Athletic de Bilbao, perhaps the most politically motivated of all the clubs. To this day the club persists in a policy of hiring only Basque players, and there is no evidence that this behaviour has a significant impact on the preference for winning.

Finally, we analyse a group of variables concerning with ownership and decision making authority. In the case of the shareholder owned team (SAD) we found that teams which were tightly controlled, generally by a family group,[12] were likely to be closer to profit maximization, but again the variable was not significant. Finally, we consider whether the club President has any influence on the inclination to maximize profits. Presidents were classified among the following jobs: construction, generic businessmen, economists, lawyers, engineers, medical doctors and a residual "other". Presidents who were businessmen were statistically more likely to buy league positions than others professionals, and among businessmen those in the construction industry were even more like to pursue winning. It is likely that businessmen would be better able extract financial advantage in their professional life from team success. Moreover in the construction industry, where planning permission from local government is so often the key to financial gain, the benefits of investing in civic pride associated with the success of the local football team are likely to be pronounced. We also find that the clubs drift toward profit maximisation as the tenure of the president increases. This is consistent with the observation that presidential elections are like auctions where the members vote for the candidate who promises to bring the best players to club, thereby leading to stronger win maximizing behaviour in the years immediately after appointment.

[12] Details of the ownership distribution are provided in Barajas (2004).

7. Conclusions

This paper has used data on the performance of football clubs in Spain and England to estimate whether behaviour is better approximated by profit maximization or win maximization. We find that choices in both the Spanish and English leagues seem to closely approximate win maximization subject to a zero profit budget constraint. The economic environments in each league are quite similar, in the sense that revenues derive primarily from ticket sales and the sale of broadcast rights, while both leagues hire players from the same markets. It seems that similar environments produce similar kinds of behaviour.

One rationalization for our findings is that decision makers are maximizing profits, but in a broader context. This explanation has some weight in the American context where major league clubs tend to belong to larger commercial enterprises. However, all of the clubs in our sample are free-standing enterprises with no significant activities outside of football. It may be the case that some of the principal shareholders are willing to tolerate losses which might be compensated through returns in some other business interest. However, while we did find a significant difference between clubs where the president would be likely to have such interests, the difference was not large and even when president was not likely to have such an interest behaviour was still better explained by win rather than profit maximization.

The question remains as to whether this behaviour is likely to persist over the longer term. It might be argued that long run competitive constraints pre-empt other forms of behaviour. Any team that adopted profit maximisation would be likely to be relegated, leading to a significant loss of future profit opportunities. If this were the case then the long run profit maximizing position would be higher than the short run profit maximizing position, which we did find to be the case. However, even in the long run, we found win maximisation a better description of club behaviour than profit maximisation. Nonetheless, there is reason to be cautious about our long run estimates. As the descriptive statistics show, the period 1994-2004 has been one of significant change, with income and expenditure increasing around five-fold in the top

divisions over the decade (this was due to the emergence of competition in broadcasting and increased demand due to media exposure). It would be implausible therefore to treat behaviour in this period as equilibrium behaviour, and one might expect clubs to pursue a win maximizing strategy over such a period with a view to obtaining a dominant position in the longer term.

While this kind of hyper-competition might be expected to emerge during a period of rapid income growth, another possibility exists. If clubs were truly profit maximizers they might be expected to collude in order to reduce competition (which in this case amounts to little more than business stealing). This kind of conduct is characteristic of the closed US major leagues, where restraints such as salary caps and revenue sharing limit economic competition and help to generate financial surpluses. Clubs in European leagues have been noticeably unsuccessful at negotiating similar restraints.

This raises a number of issues for future research. First, is the support we find for the win maximization hypothesis simply an artefact of the period under consideration or, as is often claimed, a typical characteristic of European football? Research on other leagues in other periods would help to shed light on this issue. Second, if clubs are controlled by win maximizers, is there some kind of evolutionary explanation for what we observe? Are win maximizing strategies within a league are stable in an evolutionary sense? Could profit maximizers successfully invade a population of win maximizers (and vice versa)? These research questions indicate future topics that can be fruitfully studied in the sports economics laboratory.

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Table 1. Operating profits in the "Big Five" European football leagues

Profits (million €)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
English Premiership	77	129	143	104	80	121	125	185	223
Spanish 1ª Liga	-23	19	-124	-170					
Spanish 1ª Liga *	-21	17	-101 [a]	-143 [a]	-152 [a]	-295 [b]	-511 [b]	-302 [b]	
Italian Serie A	-3	8	-36	-114	-46	-216	-404	-381	-341
German Bundesliga		37	27	47	35	87	100	138	52
French Ligue 1	5	-7	-46	-70	36	-41	-98	-61	-102

Source: Deloitte&Touche Annual Review of Football Finance (2003, 2005).
*Authors' calculations from clubs accounts. Out of the 20 teams competing in the LFP, we mark with "a" the seasons in which 19 clubs' accounts were used, while "b" implies that only 15 or 16 team' accounts were available.

Figure 1. Operating profits (England, Italy and Spain).

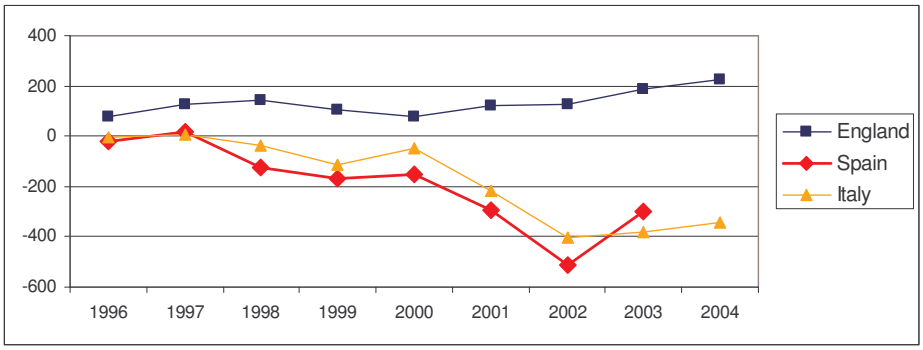

Table 2. Average revenues and average wages (as % of the revenues) for seasons.

AvRevEuros)	**Spanish Football**				**English Football**			
Year	N	1ª division	N	2ª division	N	PremierLeague	N	Championship
1994	1	4,268,892	1	3,044,909	18	19,630,924	17	6,638,792
1995	5	9,225,842	1	2,686,473	18	24,614,092	16	6,356,702
1996	19	15,620,150	4	2,509,873	18	27,062,053	15	6,815,186
1997	20	24,263,940	5	4,008,501	18	35,646,941	14	8,796,836
1998	18	29,149,850	9	6,243,958	16	50,280,071	16	12,717,063
1999	19	30,519,530	10	4,883,988	18	53,990,072	14	11,092,033
2000	19	34,147,940	11	6,611,016	17	63,663,877	14	13,653,991
2001	16	35,665,650	12	7,079,504	18	74,059,982	16	14,030,414
2002	15	41,772,720	11	5,564,037	19	86,449,068	16	19,887,189
2003	15	48,769,060	11	3,889,198	20	91,877,205	16	16,047,064
2004	11	58,988,410	1	4,143,813	18	100,987,045	18	18,812,340

%AvWage	**Spanish Football**				**English Football**			
Year	N	1ª division	N	2ª division	N	PremierLeague	N	Championship
1994	1	73%	1	48%	18	43%	17	60%
1995	5	68%	1	94%	18	42%	16	65%
1996	19	55%	4	68%	18	48%	15	75%
1997	20	45%	5	91%	18	47%	14	67%
1998	18	54%	9	72%	16	49%	16	70%
1999	19	55%	10	102%	18	55%	14	73%
2000	19	55%	11	82%	17	59%	14	94%
2001	16	70%	12	104%	18	58%	16	98%
2002	15	73%	11	138%	19	61%	16	73%
2003	15	70%	11	140%	20	61%	16	90%
2004	11	63%	1	85%	18	61%	18	71%

The records for the English leagues have been converted to Euros at the current exchange rate (1GBP = 1.47 Euros).
N: indicates the number of teams for which the financial information was available each season.

Table 3. Revenues and league position. Dep.variable: logRelRev = log(Rev/AvRev)

Spanish LFP Unbalanced Panel (1994-2004)	(1) **ols**	(2) **fixed effects**	(3) **IV fixed effects**
LogRank	0.295	0.240	0.241
	(9.75)	(6.06)	(5.94)
logRelRev(-1)	0.636	0.338	0.333
	(14.3)	(4.91)	(3.08)
Constant	-0.412	-0.499	-0.501
	(-8.83)	(-9.64)	(-7.53)
Instruments	no	no	wages(-1)
R^2	0.867	0.862	0.861
F-statistic *	736.6	36.97	385.7
No teams	37	37	37
No obs.	189	189	189
Premier League Unbalanced Panel (1994-2004)	(1b) **ols**	(2b) **fixed effects**	(3b) **IV fixed effects**
LogRank	0.184	0.183	0.173
	(10.1)	(12.9)	(11.7)
logRelRev(-1)	0.698	0.477	0.561
	(20.6)	(13.1)	(11.9)
Constant	-0.150	-0.215	-0.189
	(-9.10)	(-13.0)	(-9.89)
Instruments	no	no	wages(-1)
R^2	0.913	0.909	0.913
F-statistic *	2812	242.6	1217
No teams	57	57	57
No obs.	432	432	432

Ols using robust standard errors. (t-statistics) in parenthesis. * Chi-2, instead of F-statistic, for model (3).

Table 4. League position and wage expenditure.
Dependent variable: logRank = – log(leaguePosition/(43 – leaguePosition))

Spanish LFP Unbalanced Panel (1994-2004)	(1) **ols**	(2) **fixed effects**	(3) **IV fixed effects**
log(Wage/AvW)	0.706	0.618	0.634
	(6.86)	(3.09)	(3.10)
logRank(-1)	0.357	0.189	0.177
	(6.27)	(2.97)	(2.47)
Constant	0.734	0.798	0.812
	(7.27)	(6.60)	(6.40)
Instruments	no	no	Win%(-1) & Div(-1)
R^2	0.643	0.639	0.637
F-statistic *	173.3	15.73	190.0
No teams	40	40	40
No obs.	236	236	236
Premier League Unbalanced Panel (1994-2004)	(1b) **ols**	(2b) **fixed effects**	(3b) **IV fixed effects**
log(Wage/AvW)	0.963	1.032	0.889
	(9.67)	(6.17)	(5.14)
logRank(-1)	0.512	0.324	0.414
	(9.75)	(5.82)	(6.68)
Constant	0.211	0.273	0.223
	(3.89)	(4.91)	(3.85)
Instruments	no	no	Win%(-1) & Div(-1)
R^2	0.744	0.739	0.743
F-statistic *	608.3	76.31	181.6
No teams	57	57	57
No obs.	432	432	432

Ols using robust standard errors. (t-statistics) in parenthesis. * Chi-2, instead of F-statistic, for model (3).

Table 5. Profit maximizing and win-maximizing positions in the football leagues.

Premier League Average 1993-2004	.(1) Real Position	.(2) Max Wins	.(3) Max Profit	Spanish LFP Average 1994-2005	.(4) Real Position	.(5) Max Wins	.(6) Max Profit
Manchester United	2	5	23	RealMadrid	3	6	17
Arsenal	3	9	29	Barcelona	3	5	15
Liverpool	4	11	33	Valencia	5	6	18
Chelsea	6	9	30	Celta	7	6	18
Newcastle United	7	8	29	Deportivo	8	9	21
Aston Villa	8	12	33	Athletic	8	10	24
Leeds United	8	12	34	Valladolid	10	12	26
TottenhamHotspur	11	12	33	RealSociedad	10	10	24
West Ham United	12	14	35	Mallorca	10	12	26
Southampton	13	14	35	Malaga	10	13	27
Blackburn Rovers	13	19	38	Betis	11	8	21
Everton	14	16	36	Alaves	12	14	28
Fulham	14	20	39	Espanyol	12	12	26
Leicester City	14	14	35	AtMadrid	13	12	25
Middlesbrough	15	17	37	Zaragoza	14	15	29
Wimbledon	15	15	36	Oviedo	16	15	29
Sunderland	20	14	35	Racing	16	18	32
Bolton Wanderers	20	14	35	Sevilla	17	16	30
Charlton Athletic	20	16	37	RayoVallecano	19	15	30
Coventry City	21	19	38	Villarreal	19	16	30
Derby County	21	20	39	Tenerife	21	18	32
Manchester City	22	18	37	Recreativo	22	22	34
Ipswich Town	22	18	37	Sporting	23	23	35
Sheffield Wednesday	22	19	38	LasPalmas	24	18	32
Birmingham City	22	19	39	Salamanca	24	24	36
Nottingham Forest	23	20	39	Getafe	27	30	38
Crystal Palace	25	18	38	Compostela	27	25	37
Wolverhampton Wander	27	18	37	Numancia	27	25	36
Barnsley	27	20	39	Albacete	28	25	37
Bradford City	28	19	38	Levante	28	22	35
Sheffield United	29	22	40	Lleida	31	30	39
Norwich City	30	20	39	Logrones	34	31	39
Queen's Park Rangers	30	26	41	Leganes	34	27	38
West Bromwich Albion	30	15	36	Cordoba	35	31	39
Preston North End	32	23	40	Murcia	35	25	37
Watford	32	24	40	Hercules	41	37	41
Portsmouth	32	25	40				
Stoke City	33	20	38				
Millwall	34	24	40				
Tranmere Rovers	34	23	40				
Burnley	34	23	40				
Gillingham	35	18	38				
Huddersfield Town	35	27	41				
Port Vale	37	25	41				
Stockport County	37	25	41				
Oxford United	38	30	42				
Reading	38	29	42				
Southend United	38	23	40				
Crewe Alexandra	38	22	40				
Grimsby Town	39	28	42				
Oldham Athletic	39	24	41				
Walsall	40	24	41				
Swindon Town	41	26	41				
Luton Town	41	22	40				
Bury	42	31	43				

Table 6. Deviations from the profit-maximizing and win-maximizing position.

	Spanish LFP (unbalanced)			**English** leagues (unbalanced)		
Variable	N	mean	sum	N	mean	sum
(pm - p)	189	12.12		392	15.55	
(wm - p)	189	-0.48		392	-3.61	
((pm - p)^2)/N	189		190.62	392		368.75
((wm – p)^2)/N	189		39.11	392		140.47

(pm - p) is the difference between the profit-maximizing position and the real one.
(wm - p) subtracts instead the actual position from the win-maximizing (or zero-profit) position.

Table 7. Factors explaining deviations from the profit maximizing position.

	Spanish LFP (1ª and 2ª Division)			Spanish LFP (1ª Division)		
Variables	**Coeff.**	**t-stat**	**P-value**	**Coeff.**	**t-stat**	**P-value**
SecondDivision	-11.75 **	-12.82	0.000			
HistoricalStatus	-1.43 **	-2.66	0.009	-1.33 *	-2.18	0.031
RelegationRisk	2.74 **	2.98	0.003	3.18 *	2.55	0.012
AssociativeClub	-0.98	-0.59	0.559	-1.58	-0.88	0.380
ControlConcentr	-0.45	-0.52	0.603	-0.39	-0.38	0.705
DirectorReward	-0.64	-0.74	0.461	-0.07	-0.08	0.939
AtleticBilbao	1.89	0.86	0.393	3.61	1.62	0.108
HomeGrown%	3.53	1.28	0.201	1.42	0.46	0.646
YearsPresident	-0.19 **	-3.08	0.002	-0.26 **	-2.70	0.008
Businessman	2.80 *	1.99	0.048	3.69	1.43	0.156
Constructor	4.49 **	2.76	0.006	7.54 **	2.60	0.011
Economist	-2.52	-0.84	0.402	-3.82	-0.75	0.454
Lawyer	2.69	1.50	0.136	4.37	1.55	0.123
MedicalDoctor	2.47	1.20	0.232	4.74	1.51	0.134
_cons	14.76 **	9.14	0.000	13.83 **	5.14	0.000
R^2	0.59			0.22		
No obs.	189			135		
F-statistic	18.2 **			2.69 **		
Cook-Weisberg			0.791			0.809
Shapiro-Wilk			0.127			0.030

** Indicates significant at 1% and * at 5%

Dependent variable

LeagPositPurch number of positions that the club "purchase" respect to the maximizing-profits position [=profitmaximizingPosit - realPosition]

Explanatory variables

SecondDivision	dummy gathering the teams in the second division league.
HistoricalStatus	ranking of the teams as indicated by the historical cumulative points obtained in the 74 editions of 1ª division LFP, until 2005.
RelegationRisk	dummy for teams that, on average in the period, find themselves within 4 positions from the relegation-promotion positions (namely, between position 16 and 24 or between 38 and 46).
AssociativeClub	dummy for the clubs which are not shareholders companies [namely: Barcelona, RealMadrid, Bilbao, Osasuna].
ControlConcentr	dummy for teams with a high degree of control concentration (the proportion of shares controlled by the same owner or entrepreneurial group is above 80% of the total capital). Based on Barajas (2005), Table 4.2, p. 121.
DirectorReward	dummy for teams which rewarded the members of its board of directors at 30/6/2000. Source: Barajas (2005), Table 4.3, p. 124. (1: teams that pay; 0: do not pay. Teams for which this information was not available were given value zero).
AtleticBilbao	dummy for the Athletic Club de Bilbao.
HomeGrown%	percentage or share of home-grown players for each team and season.
YearsPresident	years in which the same president is in the club.
Businessman	dummy for teams whose president is a businessman.
Constructor	dummy for teams whose president is a manager in a construction company.
Economist	dummy for teams whose president is an economist.
Lawyer	dummy for teams whose president is a lawyer.
MedicalDoctor	dummy for teams whose president is medical doctor.

Appendix: Long run estimates of profit and win maximizing positions

To calculate the long run profit and win maximizing choices we use our dynamic revenue and wage equations (6) and (7). At the long run equilibrium it must be the case that $R_{it} = R_{it-1}$, $W_{it} = W_{it-1}$, $P_{it} = P_{it-1}$ and $\overline{R}_{it} = \overline{R}_{it-1}$. Hence we can write the long wage and revenue equations as

$$R_i = \overline{R}\left(\frac{43 - P_i}{P_i}\right)^{\lambda} e^{\vartheta + \mu_i}$$

$$where \quad \lambda = \frac{\gamma}{1-\delta}, \vartheta = \frac{\alpha}{1-\delta}, \mu_i = \frac{\beta_i}{1-\delta}$$

and

$$W_i = \overline{W}\left(\frac{43 - P_i}{P_i}\right)^{x} e^{-\frac{a+b_i}{c}}$$

$$where \quad x = \frac{1-d}{c}$$

Note that all time subscripts have gone. The profit and win maximizing equilibrium should be calculated in the same way as in the short run case, only now the parameters are different. Let

$$A = \overline{R}\, e^{\vartheta + \mu_i} \quad and \quad B = \overline{W}\, e^{-\frac{a+b_i}{c}}$$

so that the profit maximizing position is

$$P^* = \frac{43}{1 + \left(\frac{\lambda c A}{B}\right)^{\frac{c}{1-c\gamma}}}$$

and the win maximizing position is

$$\hat{P} = \frac{43}{1 + \left(\frac{A}{B}\right)^{\frac{c}{1-c\gamma}}}$$

The long run estimates are reported in Table A1.

Table A1. Profit maximizing and win-maximizing positions in the football leagues.

Premier League Average 1993-2004	.(1) Real Position	.(2) Max Wins	.(3) Max Profit	Spanish LFP Average 1994-2005	.(4) Real Position	.(5) Max Wins	.(6) Max Profit
Manchester United	2	0	0	RealMadrid	3	2	6
Arsenal	3	0	0	Barcelona	3	1	5
Liverpool	4	1	5	Valencia	5	2	7
Chelsea	6	1	5	Celta	7	3	9
Newcastle United	7	0	2	Deportivo	8	4	13
Aston Villa	8	1	6	Athletic	8	5	15
Leeds United	8	2	11	Valladolid	10	9	22
TottenhamHotspur	11	6	25	RealSociedad	10	10	5
West Ham United	12	3	16	Mallorca	10	7	19
Southampton	13	1	6	Malaga	10	8	21
Blackburn Rovers	13	8	29	Betis	11	4	13
Everton	14	11	32	Alaves	12	8	21
Fulham	14	4	20	Espanyol	12	8	20
Leicester City	14	2	13	AtMadrid	13	7	19
Middlesbrough	15	12	33	Zaragoza	14	13	27
Wimbledon	15	1	8	Oviedo	16	12	27
Sunderland	20	10	31	Racing	16	17	31
Bolton Wanderers	20	2	14	Sevilla	17	14	29
Charlton Athletic	20	2	14	RayoVallecano	19	19	13
Coventry City	21	17	37	Villarreal	19	13	28
Derby County	21	23	40	Tenerife	21	17	31
Manchester City	22	38	44	Recreativo	22	22	36
Ipswich Town	22	7	27	Sporting	23	26	38
Sheffield Wednesday	22	31	43	LasPalmas	24	24	16
Birmingham City	22	12	33	Salamanca	24	28	39
Nottingham Forest	23	22	40	Getafe	27	38	43
Crystal Palace	25	11	32	Compostela	27	30	40
Wolverhampton Wander	27	25	41	Numancia	27	27	29
Barnsley	27	6	25	Albacete	28	32	41
Bradford City	28	32	43	Levante	28	24	37
Sheffield United	29	18	37	Lleida	31	37	43
Norwich City	30	20	39	Logrones	34	38	43
Queen's Park Rangers	30	44	45	Leganes	34	34	33
West Bromwich Albion	30	6	24	Cordoba	35	35	37
Preston North End	32	5	23	Murcia	35	29	39
Watford	32	41	44	Hercules	41	43	44
Portsmouth	32	41	44				
Stoke City	33	28	42				
Millwall	34	41	45				
Tranmere Rovers	34	30	42				
Burnley	34	21	39				
Gillingham	35	4	18				
Huddersfield Town	35	41	44				
Port Vale	37	34	43				
Stockport County	37	20	39				
Oxford United	38	45	45				
Reading	38	45	45				
Southend United	38	45	45				
Crewe Alexandra	38	4	18				
Grimsby Town	39	42	45				
Oldham Athletic	39	45	45				
Walsall	40	31	42				
Swindon Town	41	45	45				
Luton Town	41	45	45				
Bury	42	45	45				

Note that the figures are rounded and that the upper bound for position in our model is zero rather than 1. Note also that in the case on Manchester United and Arsenal the optimal positions are close to this upper bound.

Table A2. Deviations from the profit-maximizing and win-maximizing position.

	Spanish LFP			**English** leagues		
Variable	N	mean	sum	N	mean	Sum
(pm - p)	36	8.92		55	5.42	
(wm - p)	36	-1.26		55	-5.26	
((pm - p)^2)/N	36		96	55		111
((wm – p)^2)/N	36		18	55		145

(pm - p) is the difference between the profit-maximizing position and the real one.
(wm - p) subtracts instead the actual position from the win-maximizing (or zero-profit) position.

Table A2 shows the difference between the long run estimates of the optimal win maximizing and profit maximizing positions and the actual average positions. For the Spanish leagues the results are very close indeed to the short run estimates, while for the English leagues the results suggest behaviour mid way between profit maximization and win maximization subject to a zero profit constraint.

Some caution is required with the interpretation on the long run estimates. The short run estimates are consistent with best responses, and there is no reason to suppose that the best responses would be mutually consistent. However, the long run estimates imply equilibrium behaviour, and this implies some restrictions on the model. For example the choice of wage expenditure depends on the choices of other clubs, and in equilibrium it must be case that the average wage on the right hand side of equation (7) equals the average of the best responses of each club. However, the average of the best responses in the long run model do not equal the actual average wages (and likewise average revenues do not equal the average long run best response revenues). One way to close the model is to adjust the average wage to equal to the average of the best responses, and this in turn changes the best response league positions. Note that even if this defines an equilibrium, nothing guarantees that clubs reach this equilibrium in practice.

More generally, the model is only an approximation to a contest model, since we take the average wages and revenues of rival teams as given, rather than allowing them to

emerge as the profit maximizing choice of each firm. Moreover, we do not impose any adding up constraints on league positions. This effectively allows each team to choose its league position independently of its rivals, which is the analogue of price taking behaviour in a competitive market. While this approximation can be justified in the context of estimating best responses, one should be cautious about using this approach to evaluate policy prescriptions. This problem is discussed more fully in Szymanski and Kesenne (2004).