Professional sports firm values: bringing new determinants to the foreground? A study of European soccer, 2005-2013

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Abstract

Since 2004, Forbes has proposed a list of the most valuable soccer clubs. One year later Transfermarkt began to estimate European soccer players' value. This article estimate the determinants of firm values in European soccer over the period 2005-2013 incorporating player valuations, clubs' operating income and new ownership, three variables not included previously. The results of this study demonstrate that these variables are significant factors in club valuations. More generally, club assets including stadium age, club ownership type, supporter numbers and income and past sports performances all have a significant impact.

Keywords: club value, player value, operating income, new ownership, European soccer, Forbes, Transfermarkt.

Introduction

During the summer of 2013, the Welsh soccer player Gareth Bale was transferred from Tottenham Hotspur to Real Madrid for an amount estimated to 100M€. In current euros, Bale became the world's most expensive soccer player ahead of Cristiano Ronaldo (94M€ in 2009) and Zinedine Zidane (75M€ in 2001), both also acquired by Real Madrid[1]. Interestingly, his net salary of 10M€ per year[2] does not merit his inclusion in the Top 8 highest earning soccer players in the world[3]. The reported transfer prices and salaries in soccer demonstrate that players are the key component for a professional soccer club and justify that their prospective services must be recognised as an accounting asset (Morrow, 1996). These observations seem obvious and can be applied to any other sport. However, player value has never been incorporated among determinants of professional sports firm value in any previous studies. Yet, players are an asset of each club and those acquired on the transfer market are reported as such in clubs' balance sheets. If it is possible to demonstrate that player values have a significantly positive impact on club values, then it could contribute to justifying the sums expended by some clubs on transfers and salaries. Historically, the problem in doing so arose from the unavailability for data about player values. However, since 2005 a German website (www.transfermarkt.de) has provided data about European soccer player values. Despite the website name, an estimated value is provided for all players, not just those who have been the subject of a transfer. Fans discuss player values in the Transfermarkt (2012)'s market value forum with the necessity to justify their calculation – these are then taken into consideration by transfermarkt in addition to its experts' evaluations in its update of player values. In this article, player values as per Transfermarkt are included among the determinants of European soccer club values.

As for player values, no prior studies tested for a significantly positive impact of profit. A hypothesis can be proposed to explain the fact that profit has never been included among the determinants of professional sports firm values: the current profit of a firm is not significant in explaining a firm's value. This suggests that revenues may be a better basis upon which to calculate value than profit because revenues are a good indication of a club's capacity to generate cash, whereas profit depends on financial management, any change in which can influence a firm's capacity to generate profit. Nevertheless, revenues should not be incorporated among the determinants of Forbes values since these values are calculated as a "multiple of revenues" (Fort, 2006; Geckil, Mahon & Anderson, 2007; Vine, 2004). Besides, an effective financial management team could itself be a determinant of club values. In this article, we propose to test the impact of operating income on value; this being used as a proxy for profit which is not always available.

Until 2004 no publicly valuation of European soccer teams was available. During that year, Forbes proposed for the first time a list of the 20 most valuable European soccer teams. Forbes interest in European soccer teams could be the consequence of increasing revenues in European soccer since the 1980s (Andreff & Staudohar, 2000). The fact that the valuation of European teams is so recent and incorporates only the 20 or 25 most valuable soccer teams doubtless explains why there had been no study of the determinants of European team values until as late as 2011 (Helleu, Scelles & Durand, 2011; Scelles, Helleu & Durand, 2012). It also explains why it is not possible to access more data or to extend the time period of analysis. Nevertheless, an analysis about the determinants of European soccer team values is useful for an improved understanding of determinants of professional team values, in particular because the availability of data on player values allows us to test their impact on team values.

Another point which could extend our knowledge about determinants of professional team values – perhaps more in the specific European context – is the test of the impact on club values of changes in the ownership framework of European soccer clubs. Since the beginning of the twenty-first century, a number of prominent clubs have been acquired by investors from the United States (e.g., Malcolm Glazer [Manchester United], initially George Gillett and Tom Hicks, and then John Henry [Liverpool] and Randy Lerner [Aston Villa]), Russia (e.g., Roman Abramovich [Chelsea] and Dmitry Rybolovlev [Monaco]) and the Middle East (e.g., Sheihk Mansour bin Zayed Al Nahyan [Manchester City], Sheihk Abdullah ben Nasser Al Thani [Malaga], Suleyman Kerimov [Anzhi Makhachkala] and the Qatar Investment Authority [Paris-Saint-Germain]). American investors are generally seen as profit maximizers whereas Russian and Middle Eastern investors are often considered as financially irrational. We will not focus on these differing objectives or on local community reaction to this influx of foreign capital (Bi, 2013), but instead observe the impact of new foreign ownership on club values.

In this article, we estimate the determinants of firm values in European soccer over the period 2005-2013, incorporating operating income and player value. The principal objective is to determine whether these factors are significant and, if so, to identify implications. If operating income and player value are significant, they should be included in future research, in particular about American professional team values. More specifically in European soccer, we will test the impact of new ownership on firm values. The paper consists of five parts. First, we present its theoretical basis, before going on to specify our empirical model and describe our data. In the third section we present our results. The results are discussed in the fourth section along with their implications and future research directions, with the final section of the paper setting out our conclusions.

Theoretical basis

Contributions about firm values are numerous in the managerial literature. By contrast, to our knowledge, there are only seven published papers that deal with determinants of professional sports firm values. These can be separated into two groups: those concerning real transaction prices (Humphreys & Lee, 2010; Humphreys & Mondello, 2008), in which the oldest data dates back to the 1960s and leagues are not distinguished (except *via* dummies); and those concerning values determined other than by transaction through Financial World and Forbes (Alexander & Kern, 2004; Büschemann & Deutscher, 2011; Miller, 2007, 2009; Scelles Helleu, Durand & Bonnal, 2013a), for which data continue or begin in the 1990s or even the 2000s, and each league is analyzed separately.

What are Forbes' values?

Prior to the literature review, it is important to clarify the nature of the team values provided by Forbes. Unfortunately, Forbes is somewhat vague about this: "Current values are Forbes estimates based on past transactions, enterprise values (market value plus debt) of publicly traded teams and current stadium deal (unless a new stadium is pending)." (Forbes, 2007). As noted in the Introduction section, Forbes values are calculated as a "multiple of revenues" (Fort, 2006; Geckil et al., 2007; Vine, 2004). Fort (2006, p. 12) writes that Michael Ozanian, one of the authors of the Forbes team valuation reports, revealed that those reports are a "multiple of revenues" estimate, adjusted for specific stadium/arena lease factors estimated by those authors. Vine (2004, p. 9) indicates that Forbes prefers the use of revenue rather than operating income because it is more representative of long term values. This is consistent

with the hypothesis suggested in the Introduction to explain why operating income has never been incorporated among the determinants of professional team values in previous research. Geckil et al. (2007) also stress the "income approach". They note that Forbes has no specific methodology and the author's judgment is a significant part of the valuation method but they consider that this is an unavoidable part of estimating the value of any company. For this reason, they conclude that "the Forbes estimates should be accorded some respect as a consistently presented effort to systematically estimate values, with at least a selection of supporting data and commentary." (Geckil et al., 2007, p. 2).

Literature review about the determinants of professional sports firm values

The literature review highlights several determinants of professional sports firm values. Vine (2004) incorporates revenue among determinants of value and finds that this is the most important factor. Nevertheless, we are not convinced by the decision to include revenue among determinants of value since, as specified by Vine (2004), it is representative of long term values. In our opinion, it is necessary to distinguish what is "representative" (essence) and what is "explanatory" (determinants). More generally, Vine (2004) testes different sources of revenues (gate receipts, other revenues) that we consider as "representative" rather than "explanatory" of value. This explains why Vine (2004) is not included in our table of synthesis (Table 1).

Alexander and Kern (2004) use real, per-capita income to control for differences in ticket demand that will affect a team's revenue and, hence, franchise profitability. The authors also use a city's population to control for market-size effects on franchise profitability. Large market teams have a larger potential fan base to support their franchises and, hence, are in a better position to fill their stadium or arena and negotiate lucrative cable television contracts.

Alexander and Kern use a team's final standing from the previous season. They expect a negative sign because as team performance worsens (e.g., first to fourth), revenue will likely decrease (diminution of the team's reputation or of the renewal of season tickets by holders). They also use regional identity and expect a positive effect because of an appeal to a larger geographic fan base. They use an indicator variable called "new facility" that equals 1 if the team is playing in a new stadium or arena, and 0 otherwise. They anticipate a positive impact because it affords owners additional revenue generating means such as luxury suites and enhanced concession revenues.

The variables used by Alexander and Kern are partially chosen by Miller (2007, 2009). He extends sports performance to the current year and replaces standings by winning percentages. He also replaces "new facility" by facility age, considering this to be a more accurate measure of the "newness" of a facility. He includes franchise age, years in city and an ownership dummy equal to 1 for teams playing in stadiums or arenas owned by that team and expects a positive effect for private ownership in comparison with public ownership on franchise profitability.

Humphreys and Mondello (2008) incorporate competing teams in the market in their valuation. Their argument is that professional teams in a metropolitan area are competitors, and hence the presence of more competitors reduces the franchise sale price, holding other market characteristics like metropolitan population constant. They also include team winning percentage during the five last years, whereas Humphreys and Lee (2010) integrate this percentage over the previous 10 years.

Büschemann and Deutscher (2011) include attendees per game. They assume that, since each attendee generates revenue for the franchise, the higher the number of attendees, the greater the team value. In measuring this revenue stream, they make use of team marketing annual reports from the Fan Cost Index (FCI), which are constructed annually for each franchise.

The FCI tracks the cost of attending a sporting event for a family of four. The more a franchise is able to charge for their tickets and other amenities, the more revenues they generate. Thus, the authors presume that the coefficient for the FCI would also be positively related to the team value. They incorporate the team payroll and assume that a team with high payroll expenses would offer a superior team quality and, therefore, would provide a better utility to fans. Due to this assumption, they anticipate that higher team expenses would positively influence the team value.

Scelles et al. (2013a) use historical sports performance, measured by the percentage of championship titles since the beginning of the competition. A summary of these results is provided in Table 1. We indicate the sign of the coefficient for the variables.

Empirical model and data description

Empirical model

The empirical model that we examine takes the form of:

$$F_{ti} = X_{ti}\beta + \varepsilon_{ti} \tag{1}$$

F_{ti} is the logarithm of the franchise value of team i in year t, X_{ti} is a matrix of independent variables that affect the team's value, β is a vector of parameters to be estimated and ε_{ti} is a vector of random error terms. We chose the logarithm of the franchise values because these ones are not equally distributed (Büschemann & Deutscher, 2011).

The X_{ti} matrix includes variables used in previous studies (Alexander & Kern, 2004; Miller, 2007, 2009; Humphreys and Mondello, 2008; Humphreys and Lee, 2010; Büschemann and Deutscher, 2011; Scelles et al., 2013a):

- the logarithms of regional annual real per capita income and Functional Urban Area (FUA) population and the number of other clubs ranked in Forbes lists in the FUA (local competition);

- facility age (difference between the season of the observation and the season in which it first opened);

- a dummy for private ownership (1 if private, 0 if public);

- annual average attendance;

- sports performance in t, t-1 and historically (percentage of championship titles) both in national championships and at the continental level (Champions League).

In national championships, sports performance in t and t-1 corresponds to the percentage of wins and draws. It is important to stress the particular case of Juventus FC in 2006-2007. As a result of the Calciopoli scandal, Juventus FC was relegated in 2006 (Scelles et al., 2013a). It was ranked last for the season 2005-2006 in the Italian Serie A, hence our decision to allocate it seven wins – equivalent to the number of points earned by Treviso, the team that would otherwise have finished in last place. For season 2006-2007 in Italian Serie B, we divided Juventus FC's percentage of wins and draws by two. We proceeded in the same way for Leeds United in 2004-2005 and Newcastle United in 2009-2010.

In the Champions League, sports performance in t and t-1 corresponds to a measure with a predetermined code:

- 6 for a champion title;

- 5 for final;

- 4 for semi-final;

- 3 for quarter-final;

- 2 for the last sixteen;

- 1 for elimination during the group stages;

- 0 for no participation.

Lastly, we add operating income provided by Forbes, player values provided by transfermarkt and a dummy for new foreign ownership (1 if new, 0 if not).

Data description

The sample consists of a pooled, cross-sectional, time-series panel of team-specific data for European soccer. It spans the period from 2005 to 2013, which corresponds to 204 observations[4] (see Appendix 1 for an overview of the teams involved and which years the values for the specific teams come from).

Team values and local competition data were generated by Forbes. Regional per capita income data were obtained from Eurostat. FUA population data was available on population data. Facility age, ownership and sports performance data were available on Wikipedia. Annual global attendance data were obtained from European football statistics. Player values were found on transfermarkt. We integrate dummies for championships with England the reference and for years with 2013 the reference. Table 2 shows summary statistics for the variables used in the regressions. It is important to note that among the nine clubs with a new foreign ownership identified in the Introduction (Manchester United, Liverpool, Aston Villa, Chelsea, Monaco, Manchester City, Malaga, Anzhi Makhachkala and Paris-Saint-Germain), the value of the five English clubs had been estimated annually by Forbes other than Aston Villa which had not been included since 2010, whereas the values of Malaga, Anzhi Makhachkala, Paris-Saint-Germain and Monaco were not estimated by Forbes until 2013. Table 3 provides an overview of financial data at the beginning of new foreign ownership and again in 2013.

Results

Before presenting our results, two comments must be made. First, our dataset contains 34 European teams. Nevertheless, only 15 of them were valued by Forbes during the nine periods. Consequently, there are too few observations to estimate a panel regression and measure a possible individual effect.

Second, population and attendance could have a close relationship (correlation coefficient = 0.163, significant at the 5% level). Thus, attendance per game can be endogenously determined by population (or by other variables, like income, for example). Theoretically, we can take into account this potential endogeneity by finding an instrument variable which has a significant effect on attendance (or its logarithm) and no significant effect on club value (or its logarithm). Unfortunately, our dataset does not contain this instrument. Consequently, we assume that attendance is exogenous. Significance and values for the estimated parameters are not sensitive to the presence of attendance.

Table 4 presents the results obtained by generalized linear squares regressions with time fixed effects. We comment on these results, comparing them with those obtained previously by Scelles et al. (2013a). The differences between this data and their data for European soccer are: the period (2005-2013 instead of 2004-2011); the incorporation of national sports performance, operating income and player value; and the consideration of the country effect. A R^2 of 0.698 was obtained in Scelles et al. (2013a), compared to 0.915 in this study.

Income has a significant positive impact at the 1% level. This finding coincided with that of Scelles et al. (2013a) who find no significant impact for three of the four American major leagues and even a significantly negative impact in the NBA. Their interpretation is that for European clubs it is better to be in an economically prosperous area because of limited revenue sharing that exists between teams within a country and also between countries

(Andreff, 2007; Hoehn & Szymanski, 1999; Szymanski, 2003). Indeed, there are large differences in the value national television rights deals between countries, while within each domestic league the distribution of rights results in marked differences in the sums earned by individual clubs. More generally, an economically prosperous area offers better opportunities in terms of sponsoring and merchandising and allows a club to set high prices for tickets to attend a match.

Population has a significant negative impact at the 5% level (a result also reported by Scelles et al., 2013a) whereas the impact of local competition is significantly positive at the 10% level (significant at the 1% level in Scelles et al., 2013a). A contrary result could have been expected, i.e. positive impact of population and negative impact of local competition given that a club must share local economic resources with one or several other club. One limitation of this study is the fact that not all local rival clubs are incorporated, only those ranked in the Forbes lists.

Facility age has the expected significant negative impact at the 1% level (consistent with Scelles et al., 2013a). It supports new facility projects for owners even if it does not solve the question of financing between public and private funds. Private ownership has the expected significant positive impact at the 1% level (compared to the 5% level in Scelles et al., 2013a). As Scelles et al. (2013a) note, this is consistent with the interpretation of Miller (2007, p. 449) for whom : "A team playing in a stadium that it owns will be able to capitalize the value of the stadium in the team's franchise value and will thus have a higher franchise value." New foreign ownership has a significant positive impact at the 1% level. Irrespective of the owners' objective (profit or utility maximisation), new foreign owners have had a positive effect on the values of English clubs as estimated by Forbes.

Attendance has the expected significant positive impact at the 1% level whereas it had no significant impact in Scelles et al. (2013a). Consequently, our result contradicts the

interpretation that they formulated. Indeed, Scelles et al. (2013a) put in perspective their result for attendance (no significant impact) with the significantly positive impact of income. From their point of view, for generating revenue and thus optimizing value, a club needs to be in an economically prosperous area within which people are able to spend a lot of money, rather than having a stadium full of people but eventually without maximizing gate receipts. According to our result, the two dimensions are necessary.

National sports performances in t and t-1 have no significant impact whereas that in the historical period has the expected significant positive impact at the 1% level. Continental sports performance in t has no significant impact whereas it has a significant positive impact at the 1% level in Scelles et al. (2013a). Continental sports performance in t-1 and historical continental sports performance have the expected significant positive impact at the 5% level (compared with the 1% level in Scelles et al., 2013a). These results indicate that past sports performances (last year and historical ones) are more important than sports performances in t in explaining club value in t even if sports performances in t become past ones in t+1. Historical sports performances thus seem good measures to capture the historical potential of a club, an unsurprising factor to explain team value.

Operating income and player value have a significant positive impact at the 1% level. While these results were expected, it is of note that these variables had never been incorporated among potential determinants of professional sports firm values in previous studies. We consider the implications of these important results in the next section of the paper.

The English Premier League is the European league which generates the largest revenues (Deloitte, 2013), hence why it was selected as the reference. Germany, Netherlands, Portugal, Scotland and Spain have the expected significant negative impact at the 1% level (5% level for Netherlands). However, France has no significant impact and Italy has a significantly positive impact at the 5% level. Yet, Italy and France had been decreasingly competitive over

the period 1996-2013 as their UEFA country ranking indicates (from first to fourth for Italy and from second to sixth for France). Are Italian and French soccer clubs overestimated by Forbes? Is it due to the specific nature of the Italian and French clubs included in the sample which may be unrepresentative of Italian and French clubs as a whole?

The time dummies 2005 to 2011 are significantly negative at the 1% level whereas 2012 is not significant. In Scelles et al. (2013a), only the time dummies 2006 and 2007 are significantly negative. Their hypothesis is that the overall European soccer club value depends in particular on clubs belonging to the top domestic league. Contrary to American clubs in major leagues, European soccer clubs are not certain to participate in the top domestic league every season due to the open nature of European football leagues and the resultant possibility of relegation (Andreff, 2007; Hoehn & Szymanski, 1999; Noll, 2003; Szymanski, 2003). Several clubs ranked by Forbes were relegated during the period studied: Leeds United, Newcastle United, West Ham United and Juventus FC, the most prestigious and valuable of these clubs. According to Scelles et al. (2013a), it could explain that most of time dummies are not significantly negative in comparison with the last year. Nevertheless, our results indicate that this is the case except for the last year but one.

Discussion, implications and future directions

Discussion

Results for population and local competition

We have already discussed our results individually other than for operating income and player value for which implications are developed below. Nevertheless, it seems important to emphasise the surprising results for population and local competition. The fact that only the most valuable European soccer clubs are taken into account in our study has been mentioned as a limitation. We tested our model with local competition, taken as the number of other teams playing in the first soccer division during the season under consideration and located in the same functional urban area (Mean = 2.5784; SD = 2.2533; Minimum = 0; Maximum = 7). Table 5 provides our new results. The impacts of population and competition become significant only at the 10% level instead of 5% level but they are still respectively negative and positive. We also tested our model with the log of the population divided by the number of rival teams instead of the two variables separately, both with only rival teams as listed by Forbes and then with all those rivals playing in the first division (Appendices 2 and 3). The impact of the new variable is significantly negative at the 1% level in the first model and at the 10% in the second model.

To understand the negative impact of population, the work of Kuper and Szymanski (2012) is potentially helpful. They suggest that historically population has had a negative impact on success in the Champions League, noting that while provincial towns like Nottingham, Glasgow, Dortmund, Birmingham or Rotterdam have all won European Cups [the predecessor competition to the Champions League], until 2012 no club from the seven

biggest metropolitan areas in Europe (Istanbul, Paris, Moscow, London, St Petersburg, Berlin and Athens) had been successful (Kuper & Szymanski, 2012, p. 176).

The authors propose two reasons to explain this historical underperformance in the Champions League:

- they produce few great soccer players, maybe because there are very few places to kick about in the average capital. Nevertheless, it is doubtful that cities like London or Paris are more built up than Birmingham or Glasgow;

- they have less to prove than provincial cities, having alternative sources of pride than their soccer teams. However, another interpretation relates to the nature of provincial cities: often these cities have a manufacturing base with a different socio-economic mix, which may contribute to more passionate supporters, where football is one of few escapes open to them.

The growing importance of commercialisation since the 1980s could have led to European capitals becoming the most performing cities (Helleu, 2007). Now, if the small provincial towns are not able to perform on a long or even medium term basis anymore, Kuper and Szymanski (2012) note that the biggest provincial clubs (Manchester United, Liverpool, Bayern, Barcelona, the two Milan clubs) have built up strong brands and are sufficiently populated to remain at the top of European soccer. These clubs are not really in the biggest provincial cities but they are in the biggest countries in Europe and have the largest television deals. These elements are consistent with the negative impact of population on value for the clubs in our sample that partially correspond to those described above: London (big capital) *versus* provincial clubs in the biggest countries. The absence of local competitors is globally associated with clubs in small provincial towns that are not able to perform consistently over the medium term (Newcastle, Olympique Lyonnais, Olympique de Marseille, Stuttgart, Werder Bremen, Porto, Valencia). As such, it could explain the positive impact of

competition on club value. Another explanation is that rivalry in itself can trigger people's interest for soccer and hence for their local teams. It is well documented that local derbies attract more spectators, other things being equal (Baimbridge, Cameron & Dawson, 1996; Buraimo & Simmons, 2008; Cairns, 1987; Hart, Hutton & Sharot, 1975; Peel & Thomas, 1992; Scelles, Durand, Bonnal, Goyeau & Andreff, 2013).

Impact of new ownership on club value

Our results show a significantly positive impact of new ownership in English soccer. The impact of new foreign ownership beyond English soccer is also of interest. As indicated previously, the values of Malaga, Anzhi Makhachkala, Paris-Saint-Germain and Monaco had not been estimated by Forbes until 2013. Nevertheless, it is interesting to observe the evolution of player value for Malaga and Anzhi Makhachkala. In 2010, when Sheihk Abdullah ben Nasser Al Thani became the owner of Malaga, player value was estimated at $80M. At the end of the season 2012-2013, it was estimated at $171M (+115%) but the club was subsequently excluded from participating in UEFA competitions for non-payment of players wages and tax bills on time and needed to sell its best players (player value at the end of 2013 estimated at $72M). In 2010, before Suleyman Kerimov's takeover of Anzhi Makhachkala, player value was estimated at $22M. In 2013, it was estimated at $257M (+1088%). Nevertheless, the club did not achieve to win the Russian championship and to qualify in the UEFA Champions League and Suleyman Kerimov decided to reduce his spending in 2013-2014. For this season, player value was $86M (-66%) and the club was last in the Russian championship at the end of 2013.

New foreign ownership has a significant positive impact in our model for the most valuable English soccer clubs. But at the same time the situation at Malaga and Anzhi Makhachkala illustrate risks associated with the dominant or concentrated ownership model.

Implications

Operating income

The first part of the principal objective in this study was to observe if operating income is a significant determinant of European professional soccer club value. The results show that it is indeed the case. However, some models estimate value from discounted cash flows (Markham, 2013). Operating income can be seen as a proxy for cash flows. Consequently, operating income could be a proxy for value and so should not be integrated among its determinants. Nevertheless, discounted cash flows models are based on the expected future profits. Now, operating income in n-1 (since Forbes bases its evaluations for n on the financial data in n-1) is not an expected future profit. It can be considered as an indicator for managerial and financial expertise which seems a relevant determinant of the value.

Besides, the hierarchy between clubs for operating income is not coincident with the hierarchy for value. For example, in 2005, AC Milan, the third most valuable club, and Chelsea, the eighth most valuable club, were the only clubs in the first sixteen which reported a negative operating income. More generally, the correlation coefficient between value and operating income is 0.61, a good but not very strong one, especially in comparison with the correlation coefficient between value and revenue (0.84). The fact that the correlation between these two indicators is strong is logical since revenue multiples play a large part in Forbes' clubs valuation (Markham, 2013).

With regard to these elements, a previous operating income can be considered as a determinant and not the "essence" of value. In other words, the capacity to control costs and generate operating income is a determinant of value, but not a necessary condition. A club can counterbalance a negative operating income thanks to other determinants. These observations may be surprising. In any case, it is preferable to maximize operating income: it supposes a financial or managerial expertise beyond commercial and sporting ones (Durand, Ravenel & Helleu, 2005). A club must be attentive not only to the importance of good (and thus well paid) employees on the field of play, but also off the field of play.

Player value

The second part of our principal objective in this study was to observe if player value is a significant determinant of European professional soccer club value. The results show it is the case. Consequently, a strategy based on cost minimization to optimize profit and value is not a good one since it limits the possibility to have players with high value. Players are part of a club's assets, which in turn legitimises their impact on value especially as they contribute to the generation of additional income: i.e. improved sports performances and notoriety will attract more spectators in the stadiums, increased merchandising, more sponsors and allow the club to earn more money from TV rights (partially linked to sports performances and notoriety).

Our result for player value can be used to deal with the "old" debate about the objective of clubs' owners: are they profit or utility maximizers (Rottenberg, 1956; Sloane, 1971)? This traditional distinction offers two types of owners: the American ones who would be interested by profit and the European ones who would be interested by success on the pitch. Now, European soccer club needs money to build a performing team and good players to generate

money. In other words, a virtuous circle must be implemented. More specifically, buying best players is only one way of optimizing player value. Other solutions exist, for example: investment in performance and training facilities; investment in youth development; managerial selection and ability.

It seems important to stress the fact that our result for player value are in respect of the most valuable European soccer clubs which thus have the best players. It would be interesting to consider whether this result would be replicated for clubs at other levels. Perhaps the lack of difference for player value among these clubs would make the variable not significant in explaining club value. Another point is that for these clubs, player value is perhaps more related to their potential sale value (rather than their contribution to incremental income like the sale of merchandise) than for the best clubs. Now, beyond player quality and performance, potential sale value is dependent on the remaining duration for the player contract. Besides, potential sale value is a theoretical one which may be impacted by a lot of factors: injury, player fit, demand by other clubs, number of other players with similar skills in other clubs etc. Thus, for clubs which are less financially developed it is interesting to consider whether player value is really taken into account by the market.

Lastly, the significantly positive impact of player values on European soccer team values suggests that we should test this variable in the American major leagues. However, as player values are not available for these leagues, it is necessary to provide an estimation. It is worth noting that transfers are prohibited in the American major leagues thus American teams cannot expect revenues from the sales of their best players. It does not mean that having a good player is without impact on team value, however, since it could improve the team sports performance and thus its value (even although the literature provides inconsistent results about the impact of recent sports performances on team values). Büschemann and Deutscher (2011) use team payrolls as a proxy for player values and find a significantly positive impact

on team values in the National Hockey League (NHL). Nevertheless, it is not clear that team payrolls can be considered as a good proxy for player values. Indeed, players can play at a higher or lower level than expected given their salaries. In such a case, the interest in calculating player values is to incorporate their current level and not only their expected quality given that their salaries could have been negotiated two or three years previously.

Global results

Operating income and player value optimizations are just two parts of the more global club value optimization. Our results show that other determinants are significant (we leave aside population and local competition for reasons provided previously): inhabitants' income, facility age, private ownership, attendance, continental sports performance during the last year, historical sports performance both in national and continental competitions and the national league in which the club is involved. Whether they are tangible (players, stadium) or intangible (club prestige, national league and its TV rights, fanbase and customer catchment area – some elements we can consider as related to club brand), all these determinants are part of team assets and owners and managers must be attentive to every asset's contribution to the value of a club. Nevertheless, they do not monitor all of them: inhabitants' income does not depend on the club strategy; a new facility can depend on a public decision; attendance can be limited by local potential; historical sports performance cannot be changed in the short or medium term; the club is under the influence of the national league prestige and strategy. Owners and managers must optimize every determinant under the constraints of the local context, the club history and the league in which it operates.

An interesting question is how a club should prioritize its investment? Allouche and Soulez (2005, p. 8) note that "the hypothesis is often moved forward that Manchester United had

taken advantage of its stock exchange introduction for having used, in priority, funds raised by the introduction to finance structural investments (stadiums, facilities). On the contrary, the symmetric hypothesis is formulated about clubs that had not taken advantage of their introduction, which wants that raised funds had been used, in priority, to finance risky transfers." This second hypothesis can be illustrated by the examples of Newcastle, Leeds United and Borussia Dortmund which invested in players instead of stadium. However, according to our results, investment in players is important. When Newcastle invested in Les Ferdinand, David Ginola and Alan Shearer in the middle of the 1990s, it reinforced the club value and led it in the top of the English Premier League. Thereafter the club did not sustain the same level of sports performance. Perhaps more balanced investments between players and structural assets would have been better. Rather than prioritizing one determinant, owners and managers must be attentive to all the significant determinants and be aware that both profit and utility maximizations are compatible and even necessary to value maximization. Future owners and managers can take into account all the significant determinants before deciding to choose a club.

Future directions

In our results, we suggest the necessity to extend the number of teams evaluated so as to observe if the impacts of population and local competition remain respectively negative and positive. Indeed, Forbes is based on only 20 - 25 clubs, whereas there are 114 teams in the first divisions alone of the six major European leagues (England, France, Germany, Italy, Portugal and Spain). We can anticipate that the sign of the impact for population will change with a larger number of teams. The problem is that Forbes publishes value only for 20 European soccer clubs and is not clear about its exact calculation and methodology. A

solution would be to apply a precise method to value soccer clubs. Markham (2013) proposes such a method to value English Premier League clubs. The format of his multivariate model is the following:

Club Valuation = (Revenue + Net Assets) x (Net Profit + Revenue) / Revenue x (Stadium Capacity %) / (Wage Ratio %)

It could be interesting to apply this model for all the clubs in the first divisions alone of the six major European leagues during several seasons, to validate the relevance of the values obtained and if so, to test determinants, in particular to observe the results obtained for population and competition but also for player value when the best clubs are excluded in the analysis.

In our model, R² is equal to 0.907 and even 0.915 when we include new ownership. It means that the model is very successful in explaining the determinants of the European soccer club values as provided by Forbes. Nevertheless, at least one interesting variable has been overlooked: the international dimension of firms. Indeed, soccer is the most widespread sport in the world (Desbordes, 2007). The best soccer clubs have fans everywhere and are powerful global brands (Couveleare & Richelieu, 2005). They have sponsorship deals with international firms: for example, Dubai's Emirates Airline (Real Madrid), Chevrolet (Manchester United) and Qatar Foundation (FC Barcelona). How can we measure the international dimension of such firms? One option may be to incorporate social media in value models (Scelles et al., 2013a). Their hypothesis is that the number of fans on Facebook or the number of followers on Twitter can be a measure of an international dimension. Scelles, Helleu, Durand and Bonnal (2013b) incorporate social media in their communication about values in the United States and Europe. They suggest that the great differences between major European soccer and American clubs (more fans and followers for the former ones) are the consequence of a successful European soccer club's ability to attract foreign fans. They

find a significantly positive impact of the number of fans on Facebook on values. One problem, however, is that they are not able to distinguish domestic and foreign fans. Moreover, their contribution deals with only one year (141 observations). It would be interesting to extend this study in distinguishing domestic and foreign fans. To confirm the potential interest of social media, it is convenient to note that Forbes has also identified this factor as relevant[5].

Conclusion

In this article we have estimated a value equation for major European soccer teams over the period 2005-2013 based on Forbes data. We included variables proposed in the literature as explanatory factors and three original determinants: operating income, player value and new foreign ownership. The results show that these factors are significant. While new ownership may be specific to European soccer over the period studied, operating income and player value are more generic and hence could be incorporated in future research testing the determinants of professional sports firm values in other sports and other countries. If such research confirms the significantly positive impact of operating income and player value, these variables could be considered as determinants to be systematically included in studies about the determinants of team values. More generally, team assets (financial expertise and player value but also stadium age and type of ownership, number and fans' income, and past sports performances) have a significant impact. Owners and managers must be attentive to every asset's contribution to the value of a club. This can contribute to an apparent contradiction: to have players with high value needs high salary expenses, which in turn can be seen as diminishing operating income. Nevertheless, to have players with high value increases revenues, with a positive impact on club value.

In the last part of the article, we proposed directions for future research: increasing the number of evaluated teams in European soccer (perhaps building on the model proposed by Markham, 2013) and integrating an international dimension which can be measured through the number of fans or followers on social media (Facebook and Twitter). The incorporation of this variable could allow a better specification of the model and a better understanding of the determinants of team values in Europe but also in the United States.

Notes

[1] Source: http://en.wikipedia.org/wiki/Football_Transfers, retrieved 02/10/2013.

[2] Source: http://www.telegraph.co.uk/sport/football/teams/real-madrid/10291251/Gareth-Bales-world-record-transfer-fails-to-slow-down-Real-Madrid-as-club-announces-rise-in-profits.html, retrieved 02/10/2013.

[3] Source: http://www.dailymail.co.uk/sport/football/article-2421832/Cristiano-Ronaldo-salary-record--wages-steadily-increasing.html, retrieved 02/10/2013.

[4] Forbes proposed 205 observations but for the first time in 2013, a non-European club was ranked (Brazil's Corinthians Paulista).

[5] Source: http://www.forbes.com/sites/kurtbadenhausen/2013/07/15/barcelona-and-real-madrid-rule-social-media/

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Tables

Table 1 Literature review - determinants of professional sports firm values

Authors	Periods	Variables	MLB	NBA	NFL	NHL	American major leagues	European soccer
Alexander & Kern (2004)	1991-1997	Income Population Sports performance t-1 New facility Identity	+ + + + (+)	(-) + + (+) (-)	(+) (+) + (+) (-)	(-) + + + (-)		
Miller (2007)	1990-2002	Income Population Sports performance t Sports performance t-1 Facility age Franchise age Years in city Private ownership	(+) + + + - (-) (+) (+)					

Study	Period	Variable						
Humphreys & Mondello (2008)	1969-2006 (MLB is the reference)	NBA NFL NHL Population Private ownership Franchise age Local competition Sports performance last 5 years Facility age					(+) + - + + + - (-) (-)	
Miller (2009)	1991-2005 (1991-2004 for NHL because of lockout)	Income Population Sports performance t Sports performance t-1 Facility age Years in city Private ownership	+ (+) (+) + (-) (-) (-)	+ (-) (-) (+) - (-) (-)	(+) (+) (+) + (-) (-) +			
Humphreys & Lee (2010)	1960-2009	Facility age Sports performance last 10 years Historical sports performance Population					(+) + (-) +	
Büschemann & Deutscher (2011)	2000-2009 (except season 2004-2005)	Population Payroll Fan Cost Index Years in the league Sports performance t-1 Facility age Attendance				+ + (+) (-) (+) - +		
Scelles, Helleu, Durand & Bonnal (2013a)[1]	2004-2011	Income Population Local competition Facility age Private ownership Attendance Sports performance t Sports performance t-1 Historical sports performance	(+) + (-) + + + - (-) +	- + (+) (+) (-) + + (+) +	(-) + - - + + (+) (+) +	(-) + (+) (+) + + (+) (+) +		+ - + - + (+) + + +

The result is significant at the 5% level if the sign is not in brackets; the result is not significant at the 5% level if the sign is in brackets.

[1] Scelles *et al.* (2013a) include sports performance in the UEFA Champions League for European soccer.

Table 2 Summary statistics

Variable	Mean	SD	Minimum	Maximum
Value ($Mil)	591.66	506.99	106	3,300
Income ($)	29,364	7,038	9,471	47,908
Population (Mil)	5.8302	3.8601	1.1844	12.4484
Local competition	0.9608	1.0611	0	3
Facility age	69.6814	41.6654	0	136
Private ownership	0.6765	0.4678	0	1
New foreign ownership	0.1569	0.3637	0	1
Attendance	51,000	14,680	18,085	80,521
National sports performance t	64.80%	13.01%	25%	89.47%
National sports performance t-1	64.53%	12.85%	18.42%	89.47%
National historical sports performance	13.62%	11.86%	0%	52.58%

Continental sports performance t	1.6569	1.7684	0	6
Continental sports performance t-1	1.7206	1.7279	0	6
Continental historical sports performance	3.30%	4.49%	0%	18%
Operating income ($Mil)	31.3410	49.1725	-123	214
Player value ($Mil)	338.48	174.09	88.16	863.54
Number of observations	204			

Table 3 Financial data (in M$) for clubs with new foreign ownership

Clubs and year for new foreign ownership	Data at the beginning of new foreign ownership[1]				Data in 2013			
	Club value	Revenues	Operating income	Player value	Club value	Revenues	Operating income	Player value
Chelsea (2003)	339	154	-19	527	901	409	82	525
Manchester United (2005)	1251	315	106	473	3165	502	144	446
Aston Villa (2006)	120	94	11	135	-	-	-	97
Liverpool (2007)	454	225	37	420	651	296	19	332
Manchester City (2008)	191	114	27	220	689	362	-53	571
Malaga (2010)	-	-	-	80	-	-	-	72
Anzhi Makhachkala (2010)	-	-	-	22	-	-	-	86
Paris (2011)	-	139	-41	145	-	286	11	428
Monaco (2011-2012)	-	53	-26	63	-	27	-35	257

[1] For Chelsea, 2004 Forbes data for club value, revenues and operating income, 2005 for player value.

Player values are those in t. Other data for Chelsea and Manchester City are based on Forbes (revenues and operating income in t-1), not for Paris and Monaco (revenues and operating income in t at the beginning of new foreign ownership but in t-1 for data in 2013 because those in t were not available when the article was submitted). These data for Malaga and Anzhi Makhachkala are not available.

Table 4 Estimates of the log-value equation

Variable	Coefficient	se
Intercept	5.7538***	2.1132
Log-income	0.5115***	0.1454
Log-population	-0.1414**	0.0616
Local competition	0.0852*	0.0437
Facility age	-0.0039***	0.0009
Private ownership	0.4730***	0.1606
New foreign ownership	0.2980***	0.1041
Log-attendance	0.3268***	0.1067
National sports performance t	-0.2366	0.2468
National sports performance t-1	0.3434	0.2460
Historical national sports performance	1.6976***	0.5401
Continental sports performance t	-0.0033	0.0169
Continental sports performance t-1	0.0433**	0.0175
Historical continental sports performance	1.9456**	0.9794
Operating income	0.0036***	0.0006

Player value	0.3718***	0.1002
England	ref.	
France	0.1644	0.2027
Germany	-0.2666***	0.0761
Italy	0.3875**	0.1945
Netherlands	-0.7220**	0.3627
Portugal	-1.2016***	0.2086
Scotland	-0.9148***	0.2689
Spain	-0.3371***	0.1231
2005	-0.2446***	0.0934
2006	-0.4660***	0.0985
2007	-0.5747***	0.0999
2008	-0.4488***	0.0990
2009	-0.3537***	0.0962
2010	-0.3126***	0.0920
2011	-0.4064***	0.1043
2012	-0.1384*	0.0926
2013	ref.	
R²	0.915	
Number of observations	204	

Note: * significance at 10%, ** significance at 5%, *** significance at 1%.

Table 5 Estimates of the log-value equation with local competition as the number of other teams playing in the first soccer division during the season considered and located in the functional urban area

Variable	Coefficient	se
Intercept	5.6240***	2.1045
Log-income	0.5561***	0.1647
Log-population	-0.1337*	0.0748
Local competition	0.0273*	0.0218
Facility age	-0.0038***	0.0009
Private ownership	0.4388**	0.1629
New foreign ownership	0.2823***	0.1028
Log-attendance	0.3140***	0.1035
National sports performance t	-0.2042	0.2469
National sports performance t-1	0.3947**	0.2466
Historical national sports performance	1.6400***	0.5622
Continental sports performance t	-0.0007	0.0169
Continental sports performance t-1	0.0455***	0.0176
Historical continental sports performance	2.0548**	0.9885
Operating income	0.0036***	0.0006
Player value	0.3568***	0.1003
England	ref.	
France	0.0868	0.1986
Germany	-0.3207***	0.0742
Italy	03168	0.1896
Netherlands	-0.9619***	0.3302
Portugal	-1.2553***	0.2079
Scotland	-0.9676***	0.2707
Spain	-0.3995***	0.1227
2005	-0.2483***	0.0930
2006	-0.4615***	0.0974
2007	-0.5695***	0.1006

2008	-0.4434***	0.1001
2009	-0.3649***	0.0969
2010	-0.3342***	0.0933
2011	-0.4139***	0.1062
2012	-0.1449*	0.0921
2013	ref.	
R²	0.913	
Number of observations	204	

Note: * significance at 10%, ** significance at 5%, *** significance at 1%.

Appendices

Appendix 1 Overview of teams involved and years the values come from

Countries	Teams	Years
England	Arsenal	2005-2013
	Aston Villa	2005-2009
	Chelsea	2005-2013
	Everton	2006-2009
	Leeds United	2005
	Liverpool	2005-2013
	Manchester City	2005-2013
	Manchester United	2005-2013
	Newcastle United	2005-2010, 2013
	Tottenham Hotspur	2005-2013
	West Ham United	2007-2008
France	Lyon	2005-2013
	Marseille	2005, 2007-2013
Germany	Bayer Leverkusen	2006
	Bayern Munich	2005-2013
	Borussia Dortmund	2005-2013
	Hamburg	2007-2013
	Schalke 04	2005-2013
	Stuttgart	2009, 2011
	Werder Bremen	2008-2011
Italy	AC Milan	2005-2013
	AS Roma	2005-2010, 2012
	Inter Milan	2005-2013
	Juventus	2005-2013
	Lazio Roma	2005
	Napoli	2013
Netherlands	Ajax Amsterdam	2005-2007
Portugal	FC Porto	2005-2006
Scotland	Celtic Glasgow	2005-2009
	Glasgow Rangers	2005-2007, 2009
Spain	Atletico Madrid	2011
	Barcelona	2005-2013
	Real Madrid	2005-2013
	Valencia	2006, 2008, 2012

Appendix 2 Estimates of the log-value equation with log-population divided with the number of rivalling teams listed by Forbes

Variable	Coefficient	se
Intercept	6.1879***	2.0747
Log-income	0.5549***	0.1397
Log-population / Rivalling teams	-0.1812***	0.0650
Facility age	-0.0042***	0.0009
Private ownership	0.5001**	0.1584
New foreign ownership	0.3096***	0.1023
Log-attendance	0.3222***	0.1041
National sports performance t	-0.1875	0.2535
National sports performance t-1	0.3462	0.2423
Historical national sports performance	1.5775***	0.5139
Continental sports performance t	-0.0028	0.0168
Continental sports performance t-1	0.0432**	0.0174
Historical continental sports performance	2.1005**	0.9375
Operating income	0.0036***	0.0006
Player value	0.3591***	0.1011
England	ref.	
France	0.1512	0.1927
Germany	-0.3030***	0.0653
Italy	0.3865**	0.1821
Netherlands	-0.7032**	0.3551
Portugal	-1.2167***	0.2078
Scotland	-0.9442***	0.2662
Spain	-0.3280***	0.1210
2005	-0.2513***	0.0922
2006	-0.4682***	0.0975
2007	-0.5733***	0.0982
2008	-0.4507***	0.0952
2009	-0.3576***	0.0918
2010	-0.3212***	0.0891
2011	-0.4169***	0.1032
2012	-0.1394	0.0921
2013	ref.	
R²	0.916	
Number of observations	204	

Note: * significance at 10%, ** significance at 5%, *** significance at 1%.

Appendix 3 Estimates of the log-value equation with log-population divided with the number of rivalling teams in the first division

Variable	Coefficient	se
Intercept	5.8285***	2.0888
Log-income	0.4838***	0.1359
Log-population / Rivalling teams	-0.1161*	0.0673
Facility age	-0.0034***	0.0008
Private ownership	0.4056**	0.1538
New foreign ownership	0.2672	0.0983
Log-attendance	0.2915***	0.1008
National sports performance t	-0.2902	0.2551

National sports performance t-1	0.3562	0.2439
Historical national sports performance	1.9226***	0.4975
Continental sports performance t	-0.0007	0.0167
Continental sports performance t-1	0.0474***	0.0172
Historical continental sports performance	1.5973*	0.9263
Operating income	0.0036***	0.0006
Player value	0.3818***	0.1008
England	ref.	
France	0.1315	0.1983
Germany	-0.2533***	0.0629
Italy	0.2999*	0.1751
Netherlands	-0.9667***	0.3277
Portugal	-1.3158***	0.2004
Scotland	-1.0486***	0.2652
Spain	-0.4178***	0.1104
2005	-0.2375**	0.0923
2006	-0.4413***	0.0949
2007	-0.5468***	0.0949
2008	-0.4215***	0.0913
2009	-0.3402***	0.0891
2010	-0.3116***	0.0876
2011	-0.3977***	0.1015
2012	-0.1410	0.0914
2013	ref.	
R²	0.906	
Number of observations	204	

Note: * significance at 10%, ** significance at 5%, *** significance at 1%.